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ABSTRACT

In addition to providing an information base for North Dakota decision makers faced with immediate coal development plans in Mercer County, this study is also designed to serve as a prototype for similar studies incorporating the format and assumptions of the Old West Regional Commission's "Procedures Manual". The investigation is limited to the economic impact on the private and public sectors of the temporary construction force and permanent operating personnel of the new facilities and focuses on those aspects of development which are subject to quantitative analysis. Included in the report are: a review of boom town experiences in the small, rural communities of Rock Springs and Gillette, Wyoming, and Langdon, North Dakota; a profile of Mercer County describing general characteristics, economic structure, population distribution, public sector infrastructure and governmental structure and planning activity; a description of the existing and proposed coal utilization and mining facilities; estimates of employment, income and sales, and housing needs resulting from development; an examination of the impact on major services of state, county, and city governments and school districts, and the expenditures required to provide the necessary services and facilities; a discussion of the revenue generating potential of the new mining facilities; and an outline of governmental actions such as zoning, loan programs, and revenue transfers that would minimize the net fiscal impact on public sector institutions. (NEC)

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ECONOMIC AND SOCIAL IMPACTS
OF
COAL DEVELOPMENT IN THE 1970's
FOR
MERCER COUNTY, NORTH DAKOTA

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•

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October 25, 1974

Mr. Warren C. Wood, Federal Cochairman
Old West Regional Commission
1730 K Street N.W., Suite 426
Washington, D.C. 20006

Re: OWRC Contract #10470043

Dear Mr. Wood:

It is a pleasure to submit herewith our final report of "Economic and Social Impacts of Coal Development in the 1970's for Mercer County, North Dakota."

In addition to providing an information base for North Dakota decision makers faced with immediate coal development demands, this study was also designed to serve as a prototype for analyses which the Commission would like to undertake for similar Regional Projects. The lessons learned in preparing this report indicate to us the wisdom of the Commission's course, and we are quite confident that subsequent analysts will benefit therefrom.

We would like to take this opportunity to particularly express our appreciation to the staff members of the Commission, and to officials of the State of North Dakota. Clearly, the report could not have been as successfully completed without their willing cooperation.

Sincerely,

Thomas E. Carroll

TEC/kr

Enclosures

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CHAPTER I

Introduction

Extensive coal development in Mercer County, North Dakota, will result in significant changes in the economic structure and population distribution in the County and will place new demands on the public and private sectors. In order to prepare the public and private sectors to respond to these changes, the Old West Regional Commission (OWRC) is sponsoring several socioeconomic studies of potential development areas.[1] The Commission has funded the "Procedures Manual," which describes how to assess the socioeconomic impact of the construction and operation of coal utilization facilities, in order to insure uniformity among the investigations.[2] This study of Mercer County is a prototype for these individual investigations and incorporated the format and assumptions in the "Procedures Manual."

This investigation of coal development is limited to the economic impact on the private and public sectors of the temporary construction force and permanent operating personnel of the new facilities. Its primary focus is on those aspects of development which are subject to quantitative analysis. Because of the concern of the citizens of North Dakota about the additional costs of public services, the investigation's primary emphasis is on measurement of the financial impact on public sector institutions.

Our original discussion centered on the need to document the effect of the four proposed Michigan-Wisconsin coal gasification facilities. We soon realized that only one coal gasification facility would be constructed in the 1970's, but that two coal electrification facilities would be constructed in the County in the same period. Consequently, we changed the focus of our study from an evaluation of the impact of coal gasification facilities in Mercer County to an evaluation of all coal development facilities in Mercer County. We did not consider the impact on Mercer County of coal development in neighboring counties because the vast majority of the new employment in those counties would remain there or settle in one of the regional centers, which are not located in Mercer County.[3]

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[1] The Old West Region consists of the states of Montana, Nebraska, North Dakota, South Dakota, and Wyoming.

[2] Booz, Allen & Hamilton Inc., "A Procedures Manual," Washington, D.C. 1974.

[3] This assumption was based on the fact that 84 percent of the permanent employees at the Mercer County coal electrification facilities near Stanton live in the County (Appendix C) and that 81 percent of the permanent employees at the ABM sites in Cavalier and Pembia Counties are estimated to live in the Counties in which they work. (Correspondence with Edsel Boe, Area Development Agent, North Dakota State University.)

Our analysis begins with a discussion of why rapid economic development is a problem. It reviews the North Dakota development experience with the ABM installation in Cavalier County, plus other development experiences in the Old West Region. These experiences form the basis for determining the potential problems for the private and public sectors in responding to the demands of sharp population growth.

The next step in our analysis is a profile of Mercer County. It describes the County's general characteristics, economic structure, population distribution, public sector infrastructure and governmental structure and planning activity.

Our analysis then proceeds to describe the existing and proposed coal utilization and mining facilities in Mercer County. The new coal utilization facilities include one coal gasification plant and two coal electrification plants. These utilization and mining facilities provide the basic jobs, which will be the driving force behind growth in Mercer County.

From this point, our analysis estimates economic impacts of coal development on the private sector in Mercer County. The analysis includes an assessment of total employment, population distribution, income and sales, housing needs, and private expenditures on housing and commercial facilities. The economic and spatial impacts are calculated on the basis of two different population distributions. One assumes that of the new incremental permanent employees who chose to reside in the County (80 percent), 95 percent live in population centers; the other assumes that only 70 percent live in population centers.

Equally important is our estimate of the public sector costs and revenues associated with the total projected permanent population in Mercer County. Our assessment is organized to examine the new impact on the major services of state, county and city governments, and school districts. It includes a separate discussion of the revenue generating potential of the new lignite utilization and mining facilities.

In a separate chapter, our analysis estimates the economic impact of the temporary construction force which will build the plants, mines, and required new housing. We estimate first the number of construction workers who can be expected, then the expenditures that would be required to provide the necessary facilities in the private and public sectors.

Our analysis concludes with a discussion of the impacts on the private and public sectors during both the construction and operation phases of coal development. Our particular concern is with governmental actions, such as zoning, loan programs, and revenue transfers, that would minimize the net fiscal impact on public sector institutions.

Our analysis of costs and revenues is based on 1972-1973 dollars. While we recognize that the rate of inflation between now and the 1980's will change our estimates of costs and revenues, we do not know how to adjust them for an unknown, but possibly high rate of inflation. This limitation is not too serious in that our analysis is concerned primarily with the difference between costs and revenues, and not with the absolute measurement of costs and revenues--that is, we are more interested in whether there will be a deficit or surplus than in the total costs and total revenues.

CHAPTER II

Boom Town Experiences in Western Communities

To ensure that our investigation of economic issues associated with coal development in North Dakota addresses the significant issues, we investigated the historic impact of development upon three other western communities. We examined Rock Springs, Wyoming, because it is currently experiencing a construction boom. We chose Gillette, Wyoming, because the first round of energy development has already run its course, and Langdon, North Dakota, because it is a North Dakota town which has recently experienced a construction boom.

Our review of the development issues in each community is essentially qualitative because of the limited time allowed for field work.

Rock Springs, Wyoming[4]

In 1970, Idaho Power Company and Pacific Power and Light Company announced plans to build the 800 megawatt Jim Bridger power plant in a remote area 40 miles east of Rock Springs. The companies had originally expected a peak construction force of 1,200. The current construction force is now roughly 3,000 and most have moved their families to Rock Springs. In addition, three big chemical companies are now expanding their trona mining and soda ash refining operations in the area, and the discovery of a nearby oil field has intensified exploration and development activity.

These activities have had a significant impact on Rock Springs. Its 1970 population of 11,700 has increased to 26,000. As a result, essential services have broken down. No permanent housing is available at reasonable prices, and crowded, unplanned mobile home parks are appearing in several places.[5] Education and health services lag far behind the current needs. The town had just built a new high school, which alleviated the classroom problem to some extent, but the junior high school has been forced to operate two shifts. The caseload at the local mental health clinic increased tenfold in five years, and a $5 million bond issue has just been approved to construct a new hospital. Municipal government is at the limit of its current bonding capacity, and the tax base is not increasing rapidly enough to keep up with the demands. The power plant and trona mines and plants are increasing the County property tax base by $20 million each year, while the tax base in Rock Springs grows by only $250,000 each year. Some municipal services cannot keep pace with the increasing demands. The local streets, which wind with the terrain following an old creek bed, are inadequate for a fivefold increase in traffic. Police calls have nearly quadrupled, with an increase in burglaries, thefts, assaults and barroom brawls. There is a moratorium on new hookups to the sewer system, which was operating at only 65 percent of capacity a few years back.

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[4] This description is based upon a review of newspaper articles such as: "Wyoming Offers Colorado Glimpse of Shale Future," *Rocky Mountain News*, Feb. 19, 1974; "Sweetwater Models Boom-Town Maladies," *Rocky Mountain News*, July 29, 1974; and "Town in Wyoming Finds an Industrial Boom Accompanied by Woes as Well as Wealth," *Wall Street Journal*, July 30, 1974, plus a number of personal discussions in the course of other study interviews.

[5] Demand for housing is so great that trailer camps are filling in the spaces of the ghost town of Superior which is 25 miles from Rock Springs.

Asked how the disruptive impact of development could have been minimized, public officials and others often mention three subjects. First, the city needed a better estimate of the construction population associated with all development and adequate lead time in which to prepare for this population increase. Second, control was needed over the location of residential activity. While conventional zoning powers were available, there needed to be greatly expanded authority over size and location of subdivisions, annexation, and locations of new towns. Simultaneously, land must be made available for residential housing. Orderly residential expansion in Rock Springs is hampered because the railroad and Federal Government own much of the vacant land and refuse to sell it. Third, a development corporation was needed to provide planning and financial assistance.[6] It should be able to issue revenue bonds, match grants from the Federal Government, attract private investments from corporations, guarantee loans and subsidize interest, and purchase residential mortgages. If necessary the corporation should even be able to establish mobile home parks and build permanent housing.

Gillette, Wyoming[7]

The oil boom occurred in Gillette and Campbell County between 1964 and 1970 when more than 150 companies were involved in exploration and development activities. As a result, Gillette's population increased from 3,500 in 1960 to 7,260 in 1970, or by 107 percent; the County population increased from 5,900 to 13,000, or by 120 percent. The rapid increase exhausted the housing supply, overwhelmed the medical and education services, and strained the capacity of city services. The city was surrounded with mobile home parks that provided only minimal needs for shelter. With an enrollment increase from 1,000 to 3,000, the school district was forced to place children in churches and basements. The city almost fell apart financially because there was no mobile home tax. It survived financially because it sold municipal electricity at the highest rate in the State, which in effect was an indirect tax on mobile homes.

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[6] From *Rocky Mountain News*, July 20, 1974, Summary of recommendations by the Denver Research Institute.

[7] The following section is based on interviews with several officials of Gillette, Wyoming, in August 1974.

The rapid development strained the social structure of the community as well. Campbell County and two other Wyoming counties (Carbon and Goshen) with roughly the same 1970 population recorded the same number of marriages, but the ratio of marriages to divorces ranged from 1.8 in Campbell County to 2.7 in Carbon and 3.3 in Goshen (Table 2.1).[8] Both total arrests and public drunkenness charges in Campbell were well above those of the other two counties (Table 2.2). The dropout rate for Campbell County school children, 5.0 to 6.3 percent, far exceeds the other counties and the State average (Table 2.3).

Asked why private and public sectors were overwhelmed by the oil boom, several city officials explained that no one knew how many people would come to the city or how long the boom would last. The majority of Gillette citizens did not believe that the permanent population would increase significantly. In addition city services, such as water and sewer, were inadequate for the existing population, the school district had a capacity only for the existing population, and the city and County zoning powers were inadequate in controlling where the new population settled and how it made demands for public services.

However, the same city officials argue that the coal boom of the 70's will be different for several reasons. First, the city is dealing not with 150 companies, but with five that have estimated how many employees will be associated with the construction and operational phases. Second, some of the companies themselves are building and financing permanent housing and an adequately designed park for 350 mobile homes. Third, the city, County, and school facilities are much more adequate than they were in the mid-60's. The city and County will have adequate medical care because they have established a group practice for five doctors. They are in the process of completing a new recreation center. The school district has built some excess capacity in anticipation of the boom and has contingency plans for additional capacity. In addition, the school district has revenues to meet some of the new demands because of the additional tax base resulting from the oil fields.

Langdon, North Dakota[9]

The construction and installation testing of ABM, a Safeguard Project in northeast North Dakota, occurred between 1970 and 1974. The construction phase peaked at 3,700 and the installation testing phase at 2,100. The permanent operational phase will peak at 1,500. As a result, the population in Langdon increased from 2,100 in 1970 to 3,900 in 1973 (86 percent) and in Cavalier County from 8,500 in 1970 to 12,000 in 1973 (41 percent).

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[8] Kohrs, ElDean V. "Social Consequences of Boom Growth in Wyoming." Presented before the Rocky Mountain American Association for the Advancement of Science, April 24-26, 1974, Laramie, Wyoming.

[9] The following section is based on an interview with Edsel Boe, Area Development Agent. North Dakota State University. Between 1970-1974, Mr. Boe was the liaison between the Safeguard project and the impacted communities.

Table 2.1 Marriage and Divorce Statistics, 1970

County	Population	Marriages	Divorces	Ratio
Campbell	12,957	130	72	1.8
Carbon	13,354	148	54	2.7
Goshen	10,885	129	39	3.3

Source: ElDean V. Kohrs, Ibid.

Table 2.2 Criminal Statistics, 1970

County	Arrests	Public Drunkenness	Driving While Intoxicated
Campbell	1,025	134	98
Carbon	614	56	20
Goshen	337	47	20

Source: Ibid.

Table 2.3. School Dropouts, 1969-72

County	Enrollment 1970	Dropouts 1969-70	Dropouts 1970-71	Dropouts 1971-72	Rate 1969-70	Rate 1970-71	Rate 1971-72
Campbell	3,696	70	58	80	5.0	5.2	6.3
Carbon	3,514	52	81	68	3.4	5.2	4.0
Goshen	3,178	31	33	50	2.3	2.5	3.8
Wyoming					3.4	3.4	3.8

Source: ElDean V. Kohrs, Ibid.

While the increased construction force and associated population placed new demands on the public and private sectors, the response to these demands was reasonably satisfactory. The prime contractors built mobile home parks and temporary prefab housing to supplement the existing housing stock, which had little excess capacity. Approximately 20 new businesses were opened in town, and many businesses owned by older people were sold to younger people.

The city built a new city hall (it had previously rented space), expanded the police force from two to six officers, purchased a new fire truck, replaced the old water system, expanded the sewerage treatment facilities, and improved the traffic handling capacity of several major streets. The number of permanent city employees increased from six to 20.[10] The Langdon school district handled the increase in enrollment from 800 in 1970 to 1,500 in 1973 with surplus capacity in the high school, plus a five-room addition, and a thirteen-room addition to the elementary school. The County expanded its services, particularly in the areas of police protection and highways, and the County hospital added ten new beds.

However, there were some problems in adjusting to the new population. Many old water lines (installed with inferior pipe during World War II) broke with the new pressure in the water system, and Langdon residents had to haul water. The school district had difficulties in covering operating expenses in the early years.

The financial impact on the public sector can best be examined by comparing mill levies, bonded indebtedness, and city and County budgets. The total mill levy changed very little during 1969-1973 because the taxing districts were already at their statutory limit (Table 2.4). The bonded indebtedness of the city of Langdon increased from $308,000 in 1970 to $970,000 in 1973.[11] The bonded indebtedness of the school district did not increase from 1970 to 1973. While the total city revenues and expenditures increased by 138 percent and 183 percent respectively, the per capita revenues and expenditures increased by only 30 percent and 56 percent respectively and the city budget is balanced (Table 2.5). However, the per capita property tax receipts did decrease by 25 percent over the period, indicating a lag in assessment capacity and the addition of mobile homes. The large increase in public safety expenditures was paid for with Federal funds and in street improvements with earmarked highway revenues from the State.

While the total County revenues and expenditures increased by 61 percent and 102 percent respctively, the per capita County revenues and expenditures increased by only 14 percent and 43 percent respectively (Table 2.6). The budget deficit is only an accounting

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[10] In 1970, there were two policemen, two water plant operators and two street maintenance men. In 1974 there are six policemen, five water plant men, three street maintenance men, four garbage collectors, one auditor and one secretary.

[11] The incremental debt was $435,000 for water and sewer and $227,000 for streets in new residential areas

Table 2.4 STATE, CAVALIER COUNTY LANGDON CITY, AND LANGDON SCHOOL DISTRICT MILL LEVIES, 1969-1973

	1969	1970	1971	1972	1973
State and County	65.36	65.01	65.00	65.65	73.20[a]
County Planning	1.00	1.00	1.00	1.00	1.00
Township and City	30.24	31.00	29.04	29.29	29.69
Sinking and Interest	8.94	10.61	9.17	7.45	5.64
Park District	4.00	4.00	4.00	4.00	4.00
Airport	3.30	4.00	4.00	4.00	4.00
Fire District	- - -	- - -	- - -	- - -	- - -
Special Assessments	1.48	2.61	2.90	3.01	2.35
School General Fund	34.00	34.00	30.29	30.55	30.00
School Sinking and Interest	24.36	29.34	23.21	21.26	13.82
Special Assessment	- - -	- - -	- - -	- - -	- - -
Building Fund	10.00	10.00	10.00	10.00	10.00
Social Security	- - -	- - -	2.00	4.54	5.50
Special Reserves	- - -	- - -	- - -	- - -	- - -
School Library	- - -	- - -	- - -	- - -	- - -
Retirement	- - -	- - -	2.00	2.00	2.00
Total	182.68	191.57	182.61	182.75	181.20

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[a] The large increase is a result of a 5-mill levy for farm-to-market roads and a 3-mill levy for special education

Table 2.5 LANGDON CITY BUDGET, FY 1970 AND FY 1973

FY 1970 (population 2,179)

	Revenues (Total and Per Capita)		Expenditures (Total and Per Capita)
Property Tax	$42,800 ($20)	Public Safety	$22,700 ($10)
Fines	4,900 ($ 2)	Streets	22,900 ($11)
Highway	26,000 ($12)	Other	23,800 ($11)
Liquor	10,200 ($ 5)		$69,400 ($32)
Other	1,000 ($ 0)		
	$84,900 ($39)		

FY 1973 (population 3,957)

	Revenues (Total and Per Capita)		Expenditures (Total and Per Capita)
Property Tax	$61,500 ($15)	Public Safety	$ 75,400 ($19)
Fines	20,400 ($ 5)	Streets	69,000 ($17)
Highway	54,900 ($14)	Other	52,600 ($13)
Liquor	14,400 ($ 4)		$197,000 ($50)
Federal (LEAA)[a]	33,400 ($ 8)		
State Transfer	3,500 ($ 1)		
Miscellaneous	14,200 ($ 4)		
	$202,300 ($51)		

[a] Law Enforcement Assistance Administration

Table 2.6 CAVALIER COUNTY BUDGET, FY 1970 AND FY 1973

FY 1970 (Population 8,500)

	Revenues (Total and Per Capita)		Expenditures (Total and Per Capita)
Property Tax	$445,900 ($52)	General Government	$109,700 ($13)
Highway	161,600 ($19)	Protection-Person and Property[a]	36,400 ($ 4)
Miscellaneous	100,800 ($12)		
Federal Assistance	- - - - - - - -	Health	12,000 ($ 1)
Other	139,900 ($16)	Agriculture	14,000 ($ 2)
		Water	- - - - - -
	$848,200 ($100)	Relief and Charities	83,200 ($10)
		Education	11,800 ($ 1)
		Commercial Buildings	11,200 ($ 1)
		Highway	426,700 ($50)
		Other	14,400 ($ 2)
			$719,400 ($85)

[a] Including Sheriff - $14,300

FY 1973 (Population 12,000)

	Revenues (Total and Per Capita)		Expenditures (Total and Per Capita)
Property Tax	$448,400 ($37)	General Government	$244,700 ($20)
Highway	223,400 ($19)	Protection-Person and Property[b]	96,700 ($ 8)
Miscellaneous	135,900 ($11)		
Federal Assistance	202,600 ($17)	Health	13,900 ($ 1)
Other	358,500 ($30)	Agriculture	14,400 ($ 1)
		Water	1,000 ($ 0)
	$1,368,800 ($114)	Relief and Charities	122,300 ($10)
		Education	9,200 ($ 9)
		Commercial Buildings	5,500 ($ 0)
		Highway[c]	899,900 ($75)
		Other	15,200 ($ 1)
			$1,422,800 ($119)

[b] Including Sheriff - $54,000

[c] Resurfacing farm-to-market road costs of $375,000

deficit because the FY 1973 budget did not include accumulated revenue sharing receipts. However, the per capita property tax receipts did decrease 20 percent over the period, indicating a lag in assessment capacity and the addition of mobile homes. The doubling of expenditures for County highways is not representative of future year expenditures because of an extensive resurfacing of farm-to-market roads during FY 1973. For FY 1974 the expenditure for highways will be less than $500,000.

Summary

The experiences in Gillette and Rock Springs provide sufficient evidence that a boom can disrupt the public sector. However, the situation does not have to be as chaotic as has occurred in these towns. More complete and timely information on the size and spatial distribution of the anticipated population would have made public officials more aware of the magnitude of the problem. Equally important, the public officials must have the ability to plan for development, to control the physical location of residential activity, and to secure the financial resources to invest in public facilities.

The experience in Langdon suggests that a construction boom does not have to disrupt the public sector. Advanced planning for the new population and availability of construction funds to build the necessary facilities minimized the disruptive impact. Given financial support for capital investments, the city and County governments had sufficient financial resources to meet the increased operating cost of their programs (Table 2.7). In addition, costs did not significantly change for some services. All "other" city programs (general government) costs increased by only 20 percent, and many County services (agriculture, relief and charities, and education) costs did not change during the period 1970-1973.

Table 2.7 SAFEGUARD FUNDED PUBLIC INVESTMENTS IN THE CITY OF LANGDON AND CAVALIER COUNTY

Area of Government	Type of Project	Total Cost	Safeguard Share	Other Federal Share	Local Share
City	Police salary and equipment	$ 149,100	$ 78,600	$ 26,200 (LEAA)	$ 44,300
City	Fire trucks	20,000	20,000	- - -	- - -
City	Water and Sewer	1,213,000	718,000	30,000 (EPA)	465,000
City	Parks and recreation	N.A.	36,000	- - -	N.A.
City	Airport resurfacing	N.A.	33,500	75,000	- - - -
City	Street upgrading	N.A.	718,000	- - -	N.A.
School District	Additional classrooms	557,400	557,400	- - -	- - -
	Operation and Maintenance	N.A.	- - -	77,800[a]	N.A.
County	Public health nurse	12,600	12,600	- - -	- - -
	Hospital, 10-bed expansion	440,300	440,300	- - -	- - -
	Total all Projects	N.A.	2,614,400	209,000	N.A.
	Total all Projects where data was complete	$2,392,400	$1,826,900	$ 56,200	$509,300

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[a] The district has not received payments for the 1972 and 1973 school years.

CHAPTER III

The Study Area: Mercer County

Development of lignite coal in Mercer County will result in significant changes in its economic structure and population distribution. The present economy is based primarily on agriculture, and the population base has been subject to significant net out-migration since the 1930's. To appreciate the potential role of lignite development in changing the economic base and in reversing the historic trend of population out-migration, the material in this Chapter describes the County's general characteristics, economic structure, population distribution, public sector infrastructure (including all cities), and governmental structure and planning capacity.

General Characteristics[12]

Location

Mercer County is located in western North Dakota (Figures 3.1 and 3.2). It covers an area of approximately 1,115 square miles. Its significant physical boundaries are Lake Sakakawea on the north and the Missouri River on the east. It is approximately 70 miles northwest of Bismarck, North Dakota and 50 miles northeast of Dickinson, North Dakota.

Historical Development

The Mandan, Ree, and Groventre Indian tribes were the first inhabitants of Mercer County. The Mandans were a peaceful, agricultural tribe, and their farming skills were noted by many early explorers.

In 1738, Verendrye, the French-Canadian explorer, was the first white man to visit the County. Other prominent explorers who visited Mercer County include Charles LeRay, Lewis and Clark, and John Bradbury. The first white farmer to settle permanently in Mercer County was Edward Heinemeyer in 1882, the year when the first wave of families came to Mercer County.

The Legislature of Dakota Territory created Mercer County in 1883. The county was named after William Mercer, a noted early frontiersman. In 1885, Oliver County was separated from Mercer. In 1886, a group of German immigrants built cabins near the present site of the city of Stanton.

The dominant industry in Mercer has been agriculture, although coal mining has been important in the County's history. C.J. Dolan, a former gold miner, opened the first coal mine in 1884 near Hazen.

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[12] The material in this section is taken from the "Comprehensive Plan for Mercer County," prepared by R.W. Beck and Associates, April 1968.

STATE OF NORTH DAKOTA
(HIGHLIGHTING MERCER COUNTY, AND REGIONAL TRADE CENTERS)

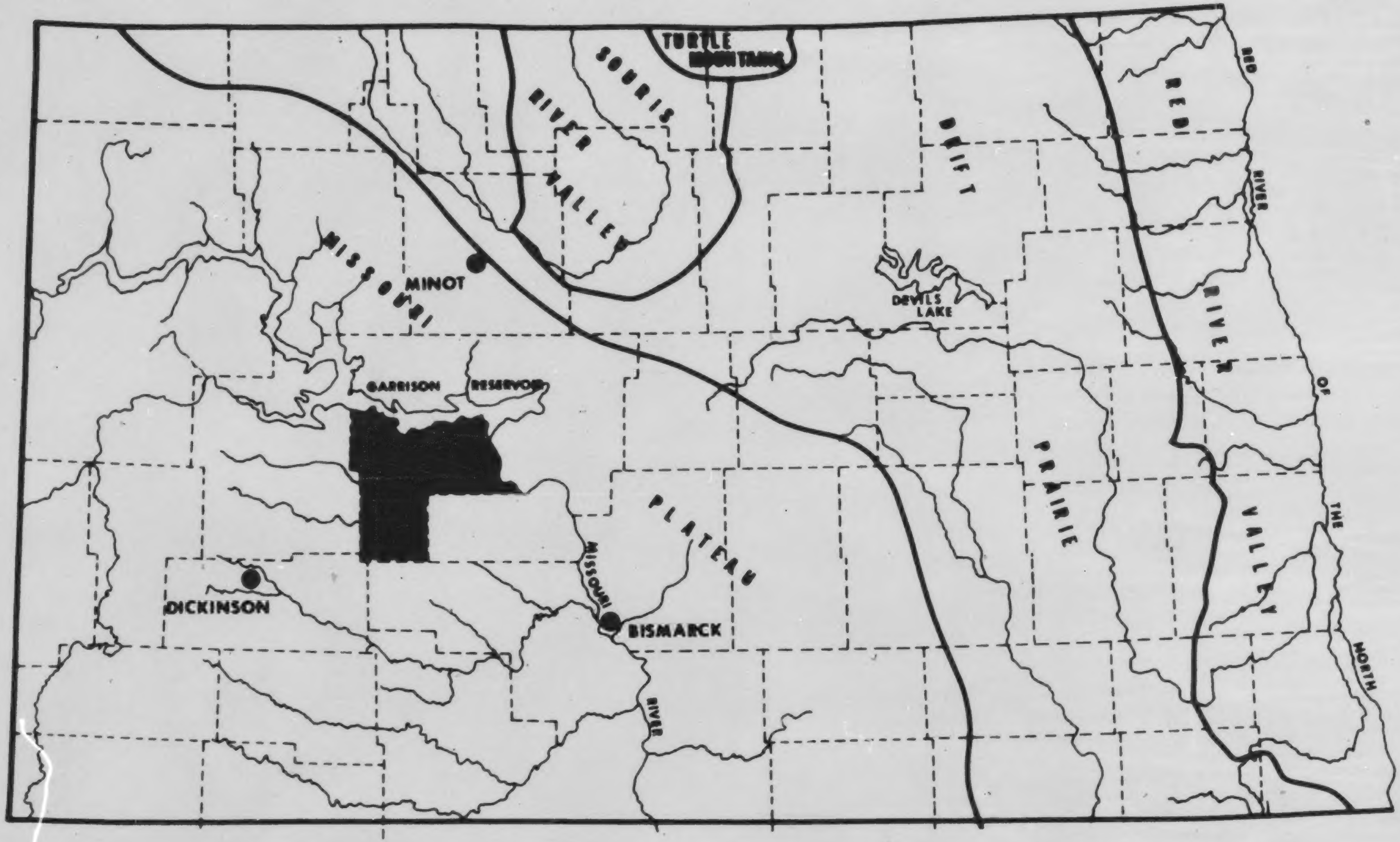
TURTLE MOUNTAINS
SOURIS
RIVER
VALLEY
MISSOURI
MINOT
DRIFT
DEVILS LAKE
GARRISON RESERVOIR
PLATEAU
MISSOURI
RIVER
DICKINSON
BISMARCK
PRAIRIE
RED
RIVER
VALLEY
RED RIVER OF THE NORTH

Figure 3.1

MERCER COUNTY, NORTH DAKOTA

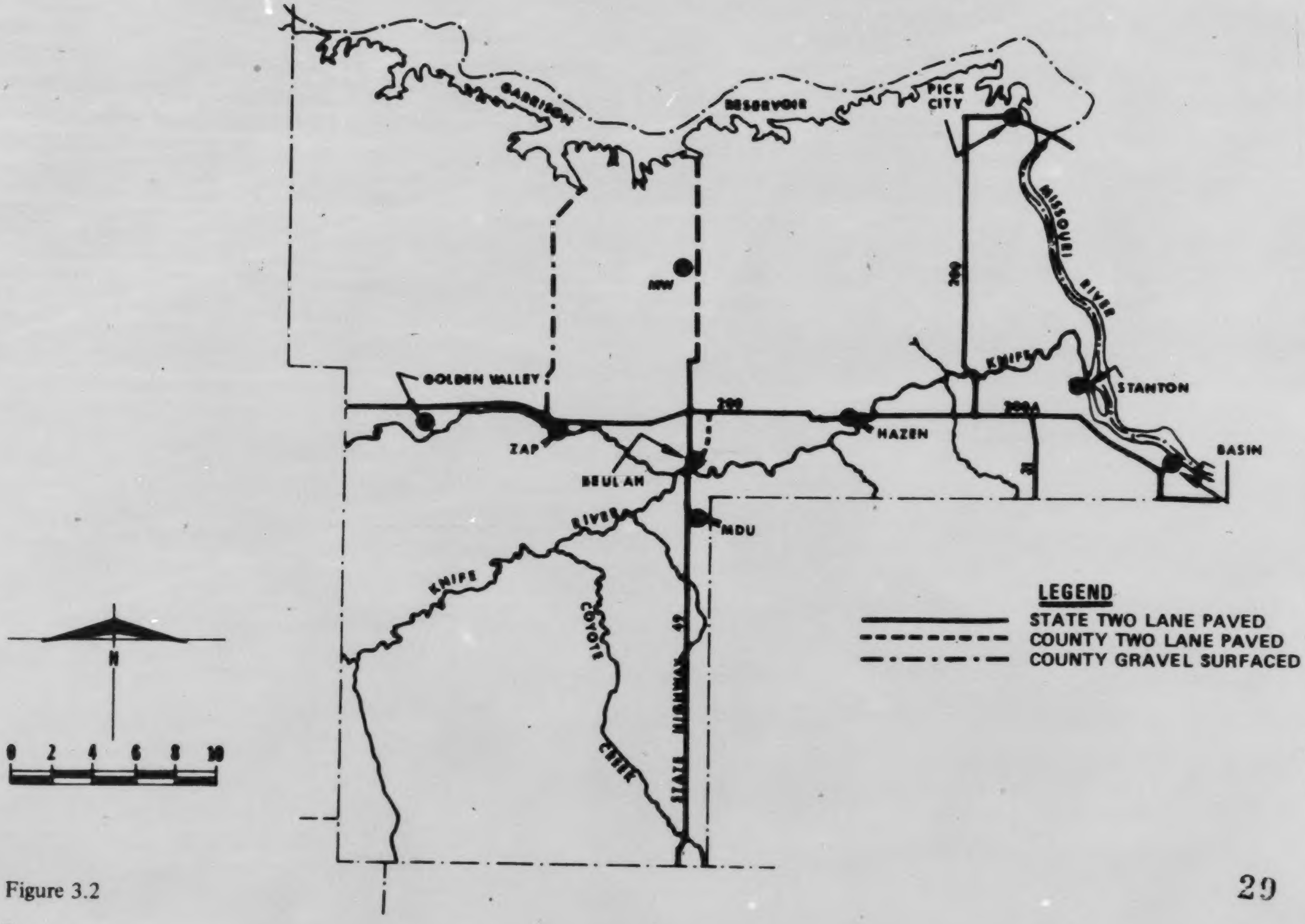
GARRISON
RESERVOIR
PICK CITY
MISSOURI RIVER
NW
200
GOLDEN VALLEY
ZAP
BEULAH
HAZEN
200A
STANTON
BASIN
MDU
KNIFE RIVER
KNIFE
COYOTE CREEK
STATE HIGHWAY 49
LEGEND
STATE TWO LANE PAVED
COUNTY TWO LANE PAVED
COUNTY GRAVEL SURFACED
N
0 2 4 6 8 10

Figure 3.2

The construction of Garrison Dam resulted in an economic boom in eastern Mercer County between 1946-1950. However, the population decline in the 20 years following the completion of Garrison Reservoir in 1950 was a surprise to Mercer County residents who had anticipated a growth in population from the expanded recreation facilities.

Physical Characteristics

Mercer County is part of the Missouri Plateau. In general, the Plateau is a gently rolling, upland region with elevations from 1,800 to 2,800 feet above sea level.

Mercer County is totally covered with glacial deposits. The glacial drift ranges in thickness from 5 to 20 feet, with typical moraine topography and numerous kames which have formed water pot holes. The water shed between the Knife River and the Missouri River drainage systems contains a small moraine approximately 20 feet high.

Climate

The Northern Great Plains, in the center of the continent, are on the edge of the semiarid region east of the Rocky Mountains. The average annual rainfall for the state is about 18 inches per year, and the average for Mercer County is about 16 inches per year.

The contrast between summer and winter temperature is severe. The winter cold spells may drop to -60° F for extended periods, while in summer the temperature may go well over 100° F.

Vegetation

The grasses in Mercer County, on the uncultivated uplands and slopes, are classified as prairie type vegetation. Trees include box elders, cottonwoods, green ash, and white elm. These species are found primarily in the valleys along streams or in the gullies. Windbreaks of trees to the northwest of farm buildings are common.

Agricultural Productivity

The primary crop in the area is hardspring wheat, which has yielded between 19 and 29 bushels per acre during the past 6 years (Table 3.1). Livestock data show that Mercer County has increased "all cattle" production at a relatively consistent rate during the same period (Table 3.2).

Economy and Population

County Economy

Employment data by industry group from Mercer County and the State of North Dakota are presented in Tables 3.3 and 3.4. Both for County and State, the sector with the greatest percentage employment was agriculture. In 1970, 33 percent of the County's labor

Table 3.1 WHEAT PRODUCTION, MERCER COUNTY, 1968-1973

Year	Bushels	Bushels/Acre
1968	1,344,000	24.1
1969	522,000	20.1
1970	1,174,000	19.3
1971	2,571,000	26.6
1972	2,209,000	29.6
1973	1,934,000	25.2

Source: North Dakota Crop and Livestock Reporting Service, North Dakota State University, Fargo, North Dakota.

Table 3.2 CATTLE PRODUCTION, MERCER COUNTY, 1968-1973

Year	Production
1968	52,000
1969	50,000
1970	52,000
1971	63,000
1972	60,000
1973	73,000

Source: North Dakota Crop and Livestock Reporting Service, North Dakota State University, Fargo, North Dakota.

Table 3.3 EMPLOYMENT BY INDUSTRY GROUP, MERCER COUNTY, 1950-1970

Industry Group	1950 No.	1950 Percent	1960 No.	1960 Percent	1970 No.	1970 Percent	Percent Change 1959-60	Percent Change 1960-70	Percent Change 1950-70
Agriculture, Forest, & Fisheries	1,387	49.8	1,118	48.2	713	33.4	-19.3	-36.2	-43.5
Mining	189	6.8	101	4.4	115	5.9	-46.6	+13.9	-39.2
Construction	240	8.6	80	3.4	151	7.1	-66.6	+88.8	-37.1
Manufacturing (Total)	25	0.9	20	0.9	9	0.4	-20.0	-55.0	-64.0
Durable Goods	4	0.1	- -	- -	- -	- -	-100.0	0.0	-100.0
Food and Kindred Products	11	0.4	16	0.7	6	0.3	+45.5	-62.5	-45.5
Printing, Publishing, and Allied Products	6	0.2	4	0.2	3	0.1	-33.3	-25.0	-50.6
Other Nondurable Goods	4	0.4	- -	- -	- -	- -	-100.0	0.0	-100.0
Transportation, Communication	69	2.4	34	1.5	70	3.3	-50.0	+105.3	+ 1.4
Utilities and Sanitary Sewers	48	1.7	33	1.4	175	8.2	-31.2	+430.3	+264.6
Wholesale Trade	40	1.4	69	3.0	21	0.9	+72.5	-69.5	-47.5
Food and Dairy Product Stores	63	2.3	48	2.1	69	3.2	-23.8	+43.7	+ 9.5
Eating and Drinking Places	76	2.7	125	5.4	49	2.3	+64.5	-60.8	-35.5
Trade	176	6.3	211	9.1	210	9.8	+19.8	- 0.4	+19.3
Finance, Insurance, and Real Estate	25	0.9	56	2.4	71	3.3	+124.0	+26.8	+184.0
Miscellaneous Services	309	11.1	327	14.1	388	18.2	+5.8	+18.6	+25.6
Public Administration	70	2.5	65	2.8	91	4.3	-7.1	+40.0	+30.0
Industry Not Reported	67	2.4	32	1.4	- -	- -	-52.3	-100.0	-100.0
Total Employment	2,784	100.0	2,319	100.0	2,132	100.0	-16.7	-8.1	-23.4

Source: 1950, 1960, 1970 Census of Population.

Table 3.4 EMPLOYMENT BY INDUSTRY GROUP, STATE OF NORTH DAKOTA, 1950-1970

Industry Group	1950 No.	1950 Percent	1960 No.	1960 Percent	1970 No.	1970 Percent	Percent Change 1950-60	Percent Change 1960-70	Percent Change 1950-70
Agriculture, Forest, & Fisheries	98,841	44.2	70,166	32.8	43,575	21.3	-29.0	-37.9	-55.9
Mining	755	0.3	2,017	0.9	1,638	.8	+167.2	-18.8	+116.9
Construction	11,270	5.0	11,426	5.3	11,165	5.4	+1.4	-2.3	-0.9
Manufacturing (Total)	6,746	3.0	7,856	3.7	9,548	4.7	+16.5	+21.5	+41.5
Durable Goods	1,581	0.7	1,900	0.9	3,832	1.9	+20.2	+101.7	+142.4
Food and Kindred Products	3,264	1.5	3,470	1.6	2,846	1.4	+6.3	-18.0	-12.8
Printing, Publishing, and Allied Products	1,476	0.7	1,741	0.8	1,693	0.8	+17.6	-2.8	+14.7
Other Nondurable Goods	425	0.2	745	0.3	1,177	0.6	+75.3	+58.0	+176.9
Transportation, Communication	13,289	5.9	11,298	5.3	10,011	4.9	+15.0	-11.4	-24.7
Utilities and Sanitary Sewers	2,288	1.0	2,321	1.1	3,288	1.6	+1.4	+41.7	+43.7
Wholesale Trade	8,080	3.6	8,736	4.1	9,005	4.4	+8.1	+0.9	+11.4
Food and Dairy Product Stores	5,048	2.3	4,924	2.3	5,184	2.5	-2.5	+5.3	+2.7
Eating and Drinking Places	6,988	3.1	6,954	3.3	8,180	4.0	-0.5	+17.6	+17.1
Other Retail Trade	19,317	8.6	22,361	10.5	24,936	12.2	+15.8	+11.5	+29.1
Finance, Insurance, and Real Estate	4,025	1.8	6,495	3.0	7,431	3.6	+61.4	+14.4	+84.6
Miscellaneous Services	34,317	15.4	44,851	21.0	59,550	29.1	+30.7	+32.8	+73.5
Public Administration	8,333	3.7	10,317	5.4	11,074	5.4	+23.8	+7.4	+32.9
Industry Not Reported	3,930	1.8	3,939	1.8	- - -	- - -	+0.2	- - -	- - -
Total Employment	223,460	100.0	213,661	100.0	204,585	100.0	-4.4	-4.2	-8.4

Source: 1950, 1960, 1970 Census of Population.

force was employed in agriculture, 12 percent higher than the state-wide employment for that sector. The remainder of the County's labor force was scattered throughout the industrial group with no other prominent sector.

During 1950-1970, the State of North Dakota's total employment decreased by eight percent, while the County's total employment decreased by 23 percent. In both the State and the County, agriculture showed a significant decline. However, the total manufacturing and wholesale trade sectors showed an equally significant percentage decline in Mercer County. The sectors which showed significant increase at the State level were mining and finance, while the sectors which showed a significant increase at the County level were utilities and finance. The increase in utility employment was a result of the utilization of lignite for electrical power generation.

Data on the decline in agriculture are presented in Tables 3.5, 3.6, 3.7. The number of farms and farm operators declined between 1959-1964 in both the County and the State. The number of farms in Mercer County declined from 759 to 682 (10 percent) for Mercer County, and from 54,928 to 48,836 (11 percent) for the State. The number of individuals whose occupation was farming decreased from 962 to 629 (35 percent) during 1950-1970 in Mercer County and from 67,719 to 34,210 (50 percent) during the same period for the State of North Dakota. The average size of the farm increased from 878 to 946 acres between 1959 and 1964 in the County and from 755 to 875 acres in the State. The primary factor responsible for this trend is the mechanization of the agricultural sector. Advanced technology in farm and crop production has permitted individual farms to expand into larger units. According to local officials, the rate of change would probably have been greater except for the fact that many farmers work as truck drivers and construction workers to augment their income.

County Population

Both the State and the County lost population between 1950 and 1970, but the decrease in the State was minimal compared to the 29 percent decline in the County (Table 3.8). The Mercer County decline was similar to many other counties in the State. Only those counties with major service centers gained population in the 1960's.

The population decline resulted from a high rate of net out-migration from the County (Table 3.9). A high rate of net out-migration was also characteristic of the ten neighboring counties (Burleigh, Emmons, Grant, Ridder, McLean, Mercer, Morton, Oliver, Sheridan, and Sioux) in State Planning Area Seven.

Table 3.5 SELECTED AGRICULTURAL DATA, MERCER COUNTY, 1959-1969

	1959	1964	1969[a]
Number of Farmers (Farm Operators)	759	682	706
Land in Farms (acres)	666,748	645,083	639,932
Average Size Farm (acres)	875	946	899

Table 3.6 SELECTED AGRICULTURAL DATA, STATE OF NORTH DAKOTA, 1959-1969

	1959	1964	1969[a]
Number of Farmers (Farm Operators)	54,928	48,836	46,380
Land in Farms (acres)	42,717,368	44,452,480	43,117,831
Average Size Farm (acres)	755	875	929

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[a] The 1969 data indicate a reversal of the trend. However, the method of data collection between the 1964 and 1969 census was changed, so that the results are not quite comparable.

Source: 1959, 1964, 1969 Census of Agriculture.

Table 3.7 OCCUPATIONAL CHANGES, MERCER COUNTY AND THE STATE OF NORTH DAKOTA, 1950-1970

	Occupation			% Occupation Change		
	1950	1960	1970	1950-60	1960-70	1950-70
Mercer County						
Total Labor	2,981	2,319	2,132	-22.2	- 8.1	-28.5
Farmers	962	769	629	-20.0	-18.2	-34.6
State of North Dakota						
Total Labor	223,460	213,661	208,261	- 4.8	- 2.5	- 6.8
Farmers	67,719	53,707	34,210	-20.7	-36.3	-49.5

Source: 1950, 1960, 1970 Census of Population.

Table 3.8 POPULATION, MERCER COUNTY AND STATE OF NORTH DAKOTA

1950-1970

	Population			% Population Change		
	1950	1960	1970	1950-60	1960-70	1950-70
Mercer	8,686	6,805	6,175	-21.7	-10.0	-29.0
North Dakota	619,636	632,446	617,761	-2.1	-2.3	-1.0

Source: 1950, 1969, 1970 Census of Population.

Table 3.9 POPULATION, MERCER COUNTY AND STATE PLANNING AREA SEVEN,

1960-1970

	Population		%Population Change	Components of Change		
	1960	1970	1960-1970	Births	Deaths	Net Migration
Mercer County	6,805	6,175	-9.3	1,191	581	(-18.2%)
State Planning Area Seven	106,561	104,207	-2.2	22,813	8,489	(-15.7%)

Source: North Dakota State University Department of Agricultural Economics, "Economic Impact of Alternative Energy Development Patterns in North Dakota," prepared for Northern Great Plains Research Program.

A preliminary estimate of the July 1973 population suggests that the population decline is reversing itself (Table 3.10). The population actually increased by 0.5 percent, but there still was a net out-migration from the County.

The distribution of the population in the County between the population centers and rural areas shifted towards the population centers between 1960-1970 (Table 3.11). The population centers increased by 6 percent their share of the total population contrasted to the 15 percent population loss in the rural area.

Local Population

Population trends of all the organized places within the County did not particularly mirror the County trend during 1950-1970 (Table 3.12). The three population centers–Beulah, Hazen, and Stanton–increased their population, and Hazen actually exceeded its 1950 peak population. The significant increase in 1960-1970 in Stanton resulted from the employees at the nearby plants of the Basin Electric and United Power Association. The populations of Beulah and Hazen were prevented from declining from their 1960 population level primarily by the increase in lignite mining.

Facilities and Service Inventory

Facilities and services are provided by County and city governments and special districts. The types of facilities and services will be briefly described to determine their potential capacity for absorbing additional growth.[13]

Mercer County

Land Use. Mercer County has a land area of 660,240 acres. Approximately 97 percent is in agricultural use, and less than 1 percent is within city boundaries. Outside the city boundaries there is little scattered residential use and limited industrial uses (railroads, industrial agriculture and coal mining and coal electrification plants). There is little commercial activity within the County outside the city boundaries.

Housing Inventory. The housing stock of Mercer County contains 2,161 residential structures. According to the 1970 Census of Housing, there are 1,871 one-unit structures, 156 multiple-unit structures, and 134 mobile homes.

Public Facilities. County Roads–Approximately 107 miles of roads within the County are paved with an all-weather surface. State highways account for 90 miles, while the remaining miles are within the County road system. Within the County are also approximately 300 miles of gravelled country roads, used principally as farm-to-market roads.

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[13] See Appendix A, which describes the standards for public service.

Table 3.10 POPULATION, MERCER COUNTY, 1970-1973

Population			% Population Change	Components of Change		
1970	1972	1973		Births	Deaths	Net Migration
6,175	6,200	6,200	+0.5	300	200	-75 (-1.2%)

Source: U.S. Department of Commerce, Bureau of Census, "Population Estimates Series" P26 No. 60 March, 1974.

Table 3.11 POPULATION CENTERS, RURAL POPULATION SHIFT,

MERCER COUNTY, 1960-1970

1960			1970		
Total	Population Centers (500-1,500)	Rural (>500)	Total	Population Centers (500-1,500)	Rural (>500)
6,805	2,949	3,856	6,175	3,101	3,074
	43.3%	56.7%		50.2%	49.8%

Source: 1960 and 1970 Census of Population.

Table 3.12 CITY POPULATIONS, MERCER COUNTY, 1950-1970

	Population			% Population Change		
	1950	1960	1970	1950-60	1960-70	1950-70
Beulah	1,501	1,318	1,344	-12.2	+ 2.0	-10.5
Golden Valley	339	286	235	-15.6	-17.8	-30.7
Hazen	1,230	1,222	1,240	- 0.7	+ 1.5	+ 0.8
Pick City	294	101	119	-65.6	-17.8	-59.5
Stanton	571	409	517	-28.4	+26.4	- 9.5
Zap	425	339	271	-20.0	-20.0	-36.2
Unorganized	4,326	3,130	2,449	-27.6	-21.7	-43.4
Total Mercer County	8,686	6,805	6,175	-21.7	- 9.3	-28.9

Source: 1950, 1960, 1970 Census of Population.

Hospital–The County is currently served by a 39-bed unit hospital in Hazen. Built in 1970, it now has a 72 percent occupancy rate. The hospital has 60 full-time employees.[14] According to North Dakota State standards, a hospital with 29 beds would adequately serve the County. The excess of 10 beds would accommodate an additional 2,200 population.

Sheriff–The County sheriff's office is located next to the County courthouse in Stanton. It has offices for the sheriff and his deputies and a jail. The jail is inadequate for retaining prisoners for a long period and prisoners of different sexes. According to the Regional Council for Development, the jail should be upgraded to serve both the present and future population levels.[15]

In addition to the County sheriff and one deputy in Stanton, there are four more deputies–one for Beulah, one for Hazen, one shared by Pick City and Stanton, and one shared by Golden Valley and Zap. This gives a total County force of six. According to North Dakota State standards, the four men serving the rural area should provide adequate protection.

Library–The County is served by a library system recently organized by Mercer and McLean Counties. It is the first library system organized in North Dakota with branches, which are in Hazen and Beulah. Each town has a librarian, and the branches are open daily. The main library is in Riverdale (McLean County), where the Corps of Engineers is cooperating with the project.

According to the library standards, the joint library needs approximately 35,000 volumes. Thus, with 32,244 volumes (and also 335 records and cassettes), it is a little short of standards. However, the physical space in Riverdale is more than adequate with 4,900 square feet because less than 5 percent of the library users live in or near Riverdale. Only 3,200 square feet are needed to contain the present collection. Thus, there is adequate floor space to expand the book collection to 49,000 volumes.

County Courthouse–The County courthouse is located in Stanton, on the eastern edge of Mercer County. It is a modern structure completed in 1974 at a cost of $220,000. With 7,200 square feet of office space, it is considered adequate for the County's anticipated growth.

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[14] Three doctors are active on the staff–two from Hazen and one from Beulah.

[15] John O'Leary, Lewis & Clark 1805 Regional Council for Development, August, 1974.

The City of Beulah

Land Use. The city of Beulah encompasses approximately 273 acres of land of which 164 acres (60 percent) are developed and 109 acres (40 percent) are vacant according to a 1968 study.[16] Residential land use occupies 77 acres (47 percent), industrial land use occupies 17 acres (10 percent), commercial land use occupies 10 acres (6 percent), public and semipublic land use occupies 9 acres (5 percent), and streets and alleys occupy 51 acres (31 percent).

Housing Inventory. The housing stock of Beulah contains 459 residential structures. According to the 1970 Census of Housing, there are 375 one-unit structures, 59 multiple-unit structures, and 25 mobile homes. Our field investigation in the summer of 1974 revealed that there are few vacant units beyond normal turnover.

Public Facilities. City Hall–The city hall is relatively new and provides adequate space. It houses the city administrative office and police and fire departments and has a general purpose meeting room. It could serve a population of 4,000 to 5,000. There is excess capacity for an additional population increment of 2,500 to 3,500.

Convention Center–The city recently built a convention center on the northern edge of its boundaries. It has a floor space of 9,000 square feet.

Fire Protection–A joint city-rural fire district was organized in 1974 and is served by a 58-man volunteer force. Two fire trucks are available to serve approximately 3,000 people in a 215-square-mile area. According to fire protection standards, this type of protection is adequate for a population of 9,600. There is excess capacity for an additional population increment of 6,600.

Police Protection–One city policeman and one deputy sheriff are assigned to the city and surrounding rural area. (The salary of the deputy sheriff is primarily paid with Federal funds.) According to the standards, this level of protection is adequate for the city and nearby rural area population.

Water–The city uses well water as its source of water supply. The water is pumped with a 430,000-gallon pump and is subject to treatment and chlorination. (It is the only complete water treatment plant in the County.) The average daily water use is 100,000 gallons or 75 gallons per capita; the peak daily use is 255,000 gallons or 190 gallons per capita. Assuming that the current peak usage of 190 gallons per capita continues and that the pumping capacity represents the capacity of the system, the water supply has an excess capacity for a population increase of 1,200.

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[16] Mercer County Comprehensive (701) Plan, 1968.

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Sewage–The city has a collection system and treatment plant. It has a 3.4-acre primary lagoon and a 7.05-acre secondary lagoon. The daily design flow is 120,000 gallons. The present average flow is 90,000 gallons. There is excess capacity for an additional population of 176.

Solid Waste–The city had contracted with a private firm in Hazen for refuse disposal as part of a County-wide system, and the municipal landfill had been abandoned. However, this contractual arrangement was terminated in July and the city is temporarily hauling its own solid waste. The city anticipates that there will be another County-wide system in the near future.

Parks and Recreation–The recreation facilities are essentially open spaces. There is a city park of 10 acres and a smaller one of ½ acre. The city recreation association operates a municipal swimming pool. The country club has a nine-hole, 60-acre golf course. There is a 35-acre rodeo grounds and a 4-acre ball park. The city has a 146-acre park and a 10-acre park on Lake Sakakawea. According to recreation standards, there is a surplus of 22 acres, which would accommodate an additional population of 1,100. This excludes the golf course and the recreation areas on Lake Sakakawea.

Roads–The city has 0.4 miles of State highway, 0.7 miles of County Federal-Aid secondary roads, and 9.6 miles (9.1 paved) of city streets.

Employees–The city currently employs six people full time–two water plant maintenance men, one garbage collector, one street maintenance man, one policeman, and one city auditor. A secretary works part time for the auditor.

The City of Golden Valley

Land Use. The city of Golden Valley encompasses approximately 145 acres of which 73 acres (51 percent) are developed and 72 acres (49 percent) are vacant according to a 1968 study.[17] Residential land use occupies 25 acres (34 percent), industrial land use occupies 2 acres (3 percent), public and semipublic land use occupies 9 acres (12 percent), commercial land occupies 2 acres (3 percent), and streets and alleys occupy 35 acres (47 percent).

Housing Inventory. The housing stock of Golden Valley contains 110 residential structures according to the 1970 Census of Housing. There are 107 one-unit structures, two multiple-unit structures, and one mobile home. Our field investigation revealed that there are few vacant units beyond normal turnover.

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[17] Mercer County Comprehensive (701) Plan, 1968.

Public Facilities. City Hall–The city hall is adequate for the current population and could serve another 100 people.

Fire Protection–The city and adjacent rural area are served by a 19-man volunteer fire department. The one truck is available to serve approximately 500 people. It has a pump capacity of 350 gallons per minute. The fire department could serve 1,250 people. There is an excess capacity for an additional 750 people.

Police Protection–There is no city policeman, but Golden Valley does share one deputy sheriff with Zap and the surrounding area. According to the standards, this level of protection is adequate for the current population.

Water–The city uses well water as its source of supply. The water is pumped with a 28,000-gallon-per-day pump and is subject to chlorination. The average daily water use is 20,000, or 90 gallons per capita; the daily peak use is 26,000 gallons or 111 gallons per capita. Assuming that the current peak usage of 111 gallons per capita continues and that the pumping capacity represents the capacity of the system, the water supply system has an excess capacity for a population increase of only 18 persons.

Sewage–The city is served by a collection system and a treatment plant consisting of a 3.8-acre primary lagoon. The daily design flow is 21,000 gallons. The present average flow is 15,000 gallons. There is an excess capacity for an additional 195 people.

Solid Waste Disposal–The city maintains a landfill. Individual householders are responsible for disposal of refuse.

Parks and Recreation–The only recreation area other than the school is a 3-acre city park. According to the recreation standards, there ought to be 6 acres of open space. However, the city has a cabin site on Lake Sakakawea.

Roads–The city has 10.0 miles of State highway, 0.6 miles of County Federal-Aid secondary, and 5.2 miles of city streets. No city streets are paved.

The City of Hazen

Land Use. The city of Hazen encompasses approximately 272 acres of land; of which 168 acres (61 percent) are developed and 104 acres (38 percent) are vacant according to a 1968 study.[18] Residential land use occupies 68 acres (40 percent), industrial land use occupies 9 acres (5 percent), commercial land use occupies 8 acres (5 percent), public and semipublic land use occupies 17 acres (10 percent), and streets and alleys occupy 66 acres (39 percent).

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[18] Mercer County Comprehensive (701) Plan, 1968.

Housing Inventory. The housing stock of Hazen contains 492 residential structures. According to the 1970 Census of Housing, there are 381 one-unit structures, 76 multiple-unit structures, and 35 mobile homes. Our field investigation in the summer of 1974 revealed that there are few vacant units beyond normal turnover.

Public Facilities. City Hall–The city hall was built in 1965. It houses the police and fire units and the city administrative office and has a general purpose meeting room. It could serve a population of 4,000 to 5,000. There is excess capacity for an additional population increment of 2,500 to 3,500.

Fire Protection–Hazen and the surrounding rural area are served by a 63-man volunteer fire department, of whom 13 are city and 50 are rural. There are two fire trucks, one city and one rural, to serve approximately 2,000 people. The trucks have pump capacities of 500 and 250 gallons per minute respectively. According to fire protection standards, this type of protection is adequate for a population of 9,600. There is excess capacity for an additional population increment of 7,600.

Police Protection–One city policeman and one deputy sheriff are assigned to the city and surrounding rural area. (The latter is primarily paid with Federal funds.) According to the standards, this level of protection is adequate for the city and nearby rural area population.

Water–The city uses well water as its source of supply. The water is pumped with two pumps with capacities of 640,000 and 352,000 gallons per day. The water is subject to chlorination, fluoridation, and iron removal; it is then pumped into an elevated steel storage tank with a capacity of 50,000 gallons. The average daily water use is 180,000 gallons or 112 gallons per capita; the peak daily use is 245,000 or 153 gallons per capita. Assuming that the current peak usage of 153 gallons per capita continues and that the pumping capacity represents the capacity of the system, the water supply system has an excess capacity for a population increase of 4,000. However, this figure is the upper limit in that Hazen, even with its current population, needs to expand its storage capacity and could not operate the system at peak capacity without drilling new wells.

Sewage–The city has a collection system and treatment plant. It has a 10.9-acre primary lagoon and 7.9-acre secondary lagoon. The daily design flow is 120,000 gallons. The present average flow is 90,000 gallons. There is excess capacity for an additional population of 460.

Solid Waste Disposal–The city had contracted with a private firm in Hazen for refuse disposal as part of a County-wide system, and its sanitary landfill had been abandoned. However, this contractual arrangement was terminated in July, and the city has a temporary contract with a firm in McLean County. The city anticipates that there will be another County-wide system in the near future.

Parks and Recreation–The recreation facilities are essentially parks. There is a 10-acre park in the city and a 35-acre park on the Knife River. The city recreation association operates a municipal swimming pool. The country club has a 9-hole, 65-acre golf course. The city has a 180-acre recreation area on Lake Sakakawea, which is 18 miles to the north. According to recreation standards, there is a surplus of 20 acres, which would accommodate another 1,000 population. This excludes the golf course and recreation area on Lake Sakakawea.

Roads–The city has 1.0 miles of State highway, 0.5 miles of County Federal-Aid secondary roads, and 7.9 miles (7.7 paved) of city streets.

City Employees–The city currently employs three people full time–one water plant and street maintenance man, one policeman, and one city auditor. Two building maintenance people are employed part time.

Pick City

Land Use. The city of Pick City encompasses approximately 100 acres of land, of which 34 acres (34 percent) are developed and 66 acres (66 percent) are vacant according to a 1968 study.[19] Residential land use occupies 8 acres (24 percent), industrial land use occupies no land, commercial occupies 1 acre (2 percent), public and semipublic land use occupies 1 acre (3 percent), and streets and alleys occupy 24 acres (71 percent).

Housing Inventory. The housing stock of Pick City contains 59 residential structures. According to the 1970 Census of Housing, there are 34 one-unit structures, no multiple-units, and 25 mobile homes. Our field investigation in the summer of 1974 did not estimate the number of vacant units.

Public Facilities. Public Buildings–Public buildings include a fire station and a vacant recreation hall, both of which are reported as structurally dilapidated.[20]

Fire Protection–Pick City receives fire protection from the city of Riverdale in McLean County.

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[19] Mercer County Comprehensive (701) Plan, 1968.

[20] Mercer County Comprehensive (701) Plan, 1968.

Police Protection–There is one deputy sheriff assigned to Pick City, Stanton and the surrounding rural area. (His salary is primarily paid with Federal funds.) According to the standards, this level of protection is adequate for these cities and nearby rural area population.

Water–The city draws its water from Lake Sakakawea and filters it through a sand pit. The average daily capacity and use are unknown.

Sewage–The city has just built a collection system and treatment plant. It has a 1-acre primary lagoon and a 0.75-acre secondary lagoon. The daily design flow is 13,000 gallons. The estimated average flow is 8,000 gallons. There is an excess capacity for an additional population of 76.

Solid Waste Disposal–The city does not provide any services.

Parks and Recreation–There is a two-acre city park in Pick City. The recreation standards indicate that this is sufficient for the present population. In addition, the main facility of Sakakawea State Park with its 661 acres is one mile north of the City. State park facilities include horseback trails, a playground, picnic and camping areas with modern sanitary facilities, and five miles of scenic roads.

Roads–Pick City has 0.5 miles of State highway, no County Federal-Aid secondary roads, and 1.3 (0.5 paved) miles of city streets.

The City of Stanton

Land Use. The city of Stanton encompasses approximately 157 acres of land, of which 102 acres (64 percent) are developed and 55 acres (36 percent) are vacant according to a 1968 study.[21] Residential land use occupies 26 acres (25 percent), industrial land use occupies 1 acre (1 percent), commercial land use occupies 3 acres (3 percent), public and semipublic land use occupies 29 acres (28 percent), and streets and alleys occupy 43 acres (42 percent).

Housing Inventory. The housing stock contains 158 residential structures. According to the 1970 Census of Housing, there are 119 one-unit structures, 15 multiple-unit structures, and 24 mobile homes. Our field investigation in the summer of 1974 revealed that there are few vacant units beyond normal turnover.

Public Facilities. City Hall–A new city hall was built in 1967. It houses the city administrative office and fire and police units and has a general purpose meeting room. It could serve double the current population.

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[21] Mercer County Comprehensive (701) Plan, 1968.

Fire Protection–The joint city-rural fire district is served by a 33-man volunteer force. There are two trucks to serve approximately 780 people. The trucks have pump capacities of 500 and 205 gallons per minute. According to standards, this type of system is adequate to serve a population of 9,600. There is an excess capacity to serve an additional population of 8,820.

Police Protection–The city currently has a full time policeman and shares a deputy sheriff with Pick City and the surrounding rural area. According to the standards this level of protection is adequate for a population of at least 825. There is an excess capacity for an additional population of 300.

Water–Private wells are the source of water, and no central water supply is planned.

Sewage–The city is served by a collection system and a treatment plant. It has a 3.13-acre primary lagoon and a 2.05-acre secondary lagoon. The daily design flow is 33,000 gallons. The present average flow is 26,000 gallons. There is excess capacity for an additional 110 people.

Solid Waste Disposal–The city had contracted with a private firm in Hazen for disposal as part of a County-wide system, and its sanitary landfill had been abandoned. However, this contractual arrangement was terminated in July, and the city has a temporary contract with a firm in McLean County. The city anticipates that there will be another County-wide system in the near future.

Parks and Recreation–The Stanton City Park contains 65 acres, which is mainly a picnic area. According to recreation standards, this is sufficient acreage for a population of about 2,700. There is an excess capacity for an increase in population of about 2,000.

Roads–The city has 0.5 miles of State highway, 0.2 miles of County Federal-Aid secondary and 4.7 miles (2.5 paved) of city streets.

City Employees–The city currently employs two people full time–one policeman and one municipal power maintenance man. Two general maintenance men and the City Auditor work part time.

The City of Zap

Land Use. The city of Zap encompasses approximately 268 acres of land, of which 49 acres (18 percent) are developed and 219 acres (72 percent) are vacant, according to a 1968 study.[22] Residential land use occupies 18 acres (36 percent), industrial land use occupies 1 acre (2 percent), commercial land use occupies 2 acres (3 percent), public and semipublic land use occupies 2 acres (4 percent), and streets and alleys occupy 26 acres (53 percent).

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[22] Mercer County Comprehensive (701) Plan, 1968.

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Housing Inventory. The housing stock of Zap contains 105 residential structures. According to the 1970 Census of Housing, there are 97 one-unit structures, no multiple-unit structures, and eight mobile homes. Our field investigation of the Mercer County housing stock did not estimate the number of vacant units in Zap.

Public Facilities. City Hall–The city hall is adequate for the current population and could serve another 100 people. In addition, it houses the fire truck.

Fire Protection–The city and adjacent rural area are served by a 40-man volunteer fire department. One truck is available to serve a population of 400 people. It has a pump capacity of 150 gallons per minute. According to fire protection standards, this type of protection is adequate to serve a population of 1,250. Thus there is excess capacity for a population of 850.

Police Protection–The city shares one deputy sheriff with Golden Valley and the surrounding rural area. (His salary is primarily paid with Federal funds.) According to the standards, this level of protection is just adequate for these cities and the nearby rural population.

Water–The city is presently served by private wells.

Sewage–The city is served by a collection system and a treatment plant. It has a 1.7-acre primary lagoon and a 1.05-acre secondary lagoon. The daily design flow is 18,000 gallons. The present average flow is 17,600. There is excess capacity for an additional three people.

Solid Waste Disposal–The city had contracted with a private firm in Hazen for refuse disposal as part of a County-wide system. However, this contractual arrangement was terminated in July, and the city has a temporary contract with a firm in McLean County.

Parks and Recreation–Presently there are no parks in Zap. According to standards, there ought to be seven acres of open space.

Roads–The city has 0.3 miles of State highway, 2.6 miles of County Federal-Aid secondary and 3.2 miles (0.8 paved) of city streets.

School Districts

Beulah. The Beulah School District encompasses an area of approximately 207 square miles. The only operating school is a combined elementary and secondary facility in Beulah. The 1973 enrollment was 350 elementary students and 166 secondary students. It has an excess capacity for 102 elementary students and 49 secondary students, according to the North Dakota Department of Public Instruction.

Golden Valley. The Golden Valley School District encompasses an area of approximately 152 square miles. The only operating school is a combined elementary and secondary facility in Golden Valley. It had a 1973 enrollment of 87 elementary students and 43 secondary students. The excess capacity for elementary students and secondary students has not been estimated by the Department of Public Instruction.

Hazen. The Hazen School District encompasses an area of approximately 246 square miles. The only operating school is a combined elementary and secondary facility in Hazen. The 1973 enrollment was 199 elementary students and 120 secondary students. It has an excess capacity for 91 elementary students and 49 secondary students, according to the Department of Public Instruction.

Pick City. Pick City is not served by a Mercer County School District but is attached to the Riverdale District in McLean County. The District had a 1973 enrollment of 172 elementary students and 80 secondary students. The excess capacity for elementary students and secondary students has not been estimated by the Department of Public Instruction.

Stanton. The Stanton School District encompasses an area of approximately 76 square miles. The only operating school is a combined elementary and secondary facility in Stanton. The 1973 enrollment was 176 elementary students and 75 secondary students. It has an excess capacity for 72 elementary students and 26 secondary students, according to the Department of Public Instruction.

Zap. The Zap School District encompasses an area of approximately 156 square miles. The only operating school is a combined elementary and secondary facility in Zap. The 1973 enrollment was 76 elementary students and 46 secondary students. The excess capacity for elementary students and secondary students has not been estimated by the Department of Public Instruction.

Governmental Structure and Planning Potential

The following section is a description of the local units of governments and associated planning commissions. In addition, it describes the regional and state planning organizations, which are available to assist Mercer County.

Local Units of Government[23]

The Board of County Commissioners exercises both legislative and administrative duties. The board has three members, who are elected for four-year terms. "Generally the Board of County Commissioners oversees the fiscal affairs of the County; verifies all accounts and authorizes payment; institutes and prosecutes civil actions in the name of the County; purchases and sells property for the County; has charge of road construction and maintenance; establishes voting precincts; reviews property assessments and levies County taxes; supervises to a certain extent the County officials and provides their equipment; establishes the County budget, and appoints some County officials and boards."[24]

The Mercer County Planning Commission consists of nine members with representation from County and city governments. Since the Board of County Commissioners has assumed responsibility for planning and zoning in unorganized townships, the County Planning Commission is responsible for planning and zoning in all unincorporated areas of the County.[25] All decisions of the Planning Commission must be approved by the Board of Commissioners. At this time, the Planning Commission does not have a staff nor has it adopted zoning ordinances or a new master plan.

Township government is nonexistent in Mercer County because the townships are unorganized. In the absence of township government, County Commissioners are required to assume administrative duties normally falling on township government. Administrative duties in this case are limited to maintenance of township roads.

Most city governments in Mercer County operate under the mayor-council plan. The council, composed of aldermen and with the mayor presiding, is elected to form the governing body of the city. The city of Stanton operates under the commissioner plan. The board of city commissioners, composed of the president of the board and four commissioners, is elected for four-year terms. In addition to serving as a legislator on the commission, each commissioner is responsible for overseeing the administration of one or more operating city departments.

Only the cities of Beulah and Hazen have planning commissions. All decisions of the planning commissions must be approved by the city council. At this time, the cities do not have planning staffs and are revising local zoning ordinances.

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[23] Orndahl, Lloyd, Henry Tomasek, and Boyd Wright, *North Dakota Government* (Grand Forks, North Dakota: Bureau of Governmental Affairs, University of North Dakota, 1973).

[24] *Ibid.*, page 65.

[25] If there were organized townships in the County, the Board of Township Supervisors would be vested with zoning powers, unless the Supervisors surrendered them to the County.

Planning Assistance

The State Planning Office is responsible for providing technical guidance to other planning centers in the State, conducting special studies and distributing monies. It currently has a permanent staff of six to seven people and a temporary staff of five to six people. One special study in progress is on the impact of coal development in North Dakota.

The Lewis and Clark 1805 Regional Council for Development provides technical planning assistance for ten counties in State Planning Area Seven, including Mercer County. Each county participates voluntarily in the regional council and contributes to the budget of the council. Most of the financial support, however, comes from Federal matching grants. The governing body consists of county commissioners, mayors, a minority group representative, and soil conservation district supervisors. The Council currently has a staff of three people and openings for two more. To date, it has assisted Mercer County and city officials by participating in County and city planning commissions, updating the Mercer County Plan, preparing a Mercer County zoning ordinance, initiating city plans for Beulah and Hazen, and establishing a data base.

CHAPTER IV

Coal Utilization

Mining Mercer County coal for electrical energy production is not a new phenomenon. When Montana Dakota Utilities (MDU) built the 15-megawatt (MW) "Old Beulah" coal electrification plant in 1927, it began the export of fossil fuel energy from the County. However, the scale of exporting fossil fuel energy did not change radically until Basin Electric Power Cooperative completed its 216-MW coal electrification plant in 1966.

Now, and until the 1980's, lignite mined in Mercer County will either be exported as a raw material or will be used to generate electrical power, much of which will be exported.[26] Beyond the 1980's, a substantial portion of the lignite will be converted to a gaseous fuel and exported by pipe. This chapter will describe the existing and proposed lignite utilization and mining facilities in Mercer County.

Existing Lignite Utilization and Mining Facilities

Total electrical generating capacity of three plants in Beulah and Stanton is now 403 MW (Table 4.1). The original generating plant, built in Beulah by MDU has a capacity of 14.9 MW. It uses 151,000 tons of coal per year and will be phased out after the completion of the proposed MDU plant south of Beulah.

Generation of electric power from coal on a large scale began in Mercer County in Stanton with completion of Basin Electric's LeLand Olds Plant in 1966. This experimental plant has a capacity of 216 MW and is typical of the first generation, larger scale electrical plants in North Dakota. The design of the system represented the first attempt to use lignite coal in the form of powder and to blow it into the furnace chamber.[27] The plant uses 1,400,000 tons of coal per year.

In 1967 the Stanton plant of the United Power Association Cooperative (UPA) was completed just north of the Basin plant. It has a capacity of 172 MW and uses 960,000 tons of coal per year.

Coal production in Mercer County has increased from 547,000 tons in 1960 to 4,385,000 tons in 1974, or by over 800 percent (Table 4.2). Over the same period, Mercer

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[26] Export of coal beyond the borders of North Dakota is limited primarily because of the physical characteristics of lignite. Its heating value is about 7,200 to 7,600 Btu's per pound, versus about 9,000 Btu's per pound for subbituminous coal. Lignite also has a water content of 32 percent, which makes it more costly to ship than subbituminous. In addition, a coal-fired electrical plant must have a furnace designed for lignite, since the equivalent amount of heat in Btu's requires a larger volume of lignite coal than the amount required for subbituminous. Thus, a plant designed for subbituminous coal would need a new furnace to convert to lignite, if the amount of electrical generating capacity were to remain constant.

[27] When slag accumulation in the furnace has made operation troublesome, a shotgun has been fired through the portholes of the furnace to remove slag. As much as a box of shotgun shells has been used at one time. This practice was learned from a Canadian operator who came to work for Basin.

Table 4.1 EXISTING LIGNITE UTILIZATION FACILITIES, MERCER COUNTY

Company and Location	Date Built	Capacity (Megawatts)	Cost	Coal Consumption (tons/yr)	Coal Suppliers
Basin Electric Power Cooperative, Stanton	1966	216	Under $36,000,000	1,400,000	Consolidation Coal Co.
Montana Dakota Utilities, Beulah	1927	14.9	?	151,000	Knife River Coal Co.
United Power Association, Stanton	1967	172	$36,000,000	960,000	North American Coal Co.
		402.9		2,511,000	

Table 4.2 COAL PRODUCTION FROM NORTH DAKOTA AND MERCER COUNTY, FY 1961-FY 1974

Fiscal Year	Production (Thousands of Tons) North Dakota	Mercer County
1961	2,525	547
1962	2,726	846
1963	2,733	940
1964	2,399	685
1965	2,637	994
1966	2,732	1,155
1967	3,543	1,075
1968	4,156	1,511
1969	4,487	1,607
1970	4,704	1,599
1971	5,639	2,224
1972	6,075	2,311
1973	6,439	2,714
1974	7,183	4,385

Source: North Dakota Bureau of Mines.

County's share of total state production has increased from 22 to 61 percent. The significant increase in Mercer County coal production in the late 1960's was a direct result of the full utilization of Basin Electric and UPA plants at Stanton. The increase in the past two years has resulted primarily from export of coal to Minnesota.

Consolidation Coal operates the Glen Harold Mine south of Stanton. It produces 1,400,000 tons per year (Table 4.3). Lignite is carried by conveyor to the Basin plant across the highway to the east. Basin is the exclusive user of this production.

Knife River Coal operates the South Beulah mine, which produces 1,800,000 tons per year. A small part of its production is used by MDU's "Old Beulah" plant; the remainder is exported outside the County.

North American Coal operates a mine west of Beulah. It produces 1,200,000 tons per year. A daily unit train hauls coal 25 miles east to UPA's Stanton plant. Other North American production is sold to State institutions and to industry.

Proposed Lignite Utilization and Mining Facilities

Two more electrical generation plants, either under construction or proposed, will increase the total generating capacity of the County to 1,708 MW, more than quadrupling the existing capacity. Also proposed is a large gasification plant utilizing lignite. These proposed facilities are listed in Table 4.4.

Scheduled for completion in April 1975 is Basin's second plant, with a generating capacity of 440 MW. It is in the final phase of construction. The capital cost of the unit is estimated at $165 million.

Construction is expected to start in 1975 on MDU's new Beulah plant. It will have two 440-MW units. The water application now being considered by the State Water Commission requests three units, but only two would be built in the remainder of the 1970's. The capital cost of each unit is estimated to be $196 million.

By far the largest single project yet proposed for North Dakota is a gasification plant to be built north of Beulah by Michigan Wisconsin Pipe Line. In early 1974, the State Water Commission granted a conditional permit for this project. The company has plans for an additional three units in Mercer County. Each gasification plant would produce 250 million cubic feet of high-Btu gas. The capital cost on the first unit is estimated at $700 million. Construction is expected to start in 1976.

Table 4.3 CURRENT (1974) MERCER COUNTY LIGNITE MINING

Company	Location	Coal Output (Tons/yr.)[a]	Acres Mined To Obtain Coal (Acres/yr.)	Current Employment
Consolidation Coal Co.	Stanton	1,400,000	80-95	78
Knife River Coal Co.	Beulah	1,800,000	80	61
North American Coal Co.	Beulah	1,200,000	80	53
		4,400,000	240-255	192

[a] FY 1974.

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Table 4.4 PROPOSED ELECTRICAL POWER AND GASIFICATION FACILITIES, MERCER COUNTY

Company	Location	Number and Type	Generated Gas or MW	Scheduled Date of Operation in Mercer County	Estimated Coal Consumption (mil. Ton/yr.)	Capital Cost	Coal Supplier
Michigan Wisconsin Pipe Line Co.	Beulah	1 coal gasification	250 million cubic ft./day	1980	10	$700	North American Coal Co.
Montana Dakota Utilities	Beulah	2 coal electric generating	440 MW each	1980	5 - 6	$196 each	Knife River Coal Co.
Basin Electric Power Cooperative	Stanton	1 coal electric generating	440 MW	April 1975	2 1/2 - 3 17.5 - 19	$165	Consolidation Coal Co.

When the proposed projects are operative in the 1980's, annual coal production in Mercer County would increase from 4.4 million tons in 1973 to 21.9 million tons, which is an increase of 17.5 million tons (Table 4.5).[28] This estimate does not include potential tonnage for export from the County, but we do not anticipate that export would increase measurably because of the previously mentioned difficulties.

The increased coal production would also result in a significant increase in the acres stripped. In 1974, approximately 250 acres were stripped. In the 1980's 1,000 additional acres would be stripped annually. Assuming a project life of 25 years for the new developments, 25,000 additional acres (39 square miles) would be stripped.

New Employment Resulting From Lignite Development

The new employees would be both the temporary construction personnel and the permanent operating force for the new plants and associated mining activities. At this time there is uncertainty about the precise number of employees in both phases, but the estimates do not differ greatly (Tables 4.6, 4.7, and 4.8). While the Basin construction force will peak in 1974, the Michigan Wisconsin and MDU construction forces will peak within one year of each other given the projected schedules (Table 4.9). When completed, the plants would create 1,376 permanent positions.

Profiles of Companies

Profiles of the seven companies that are involved in existing or proposed utilization of lignite for electrical generation, coal gasification and mining coal have been compiled. Three of these have home offices in North Dakota. The four others are based in Michigan, Minnesota, Pennsylvania, and Ohio.

Basin Electric Power Cooperative

Basin Electric Power Cooperative, Bismarck, North Dakota, is a wholesale power supplier for a federation of area power supply cooperatives. It serves 118 distribution cooperatives in the eight Missouri Basin states: North Dakota, South Dakota, Montana, Minnesota, Wyoming, Colorado, Nebraska and Iowa. Organized in 1961, its first commercial power was produced at the Stanton plant in 1966. The Cooperative now has two plants with a total of 259 MW. One additional 400 MW plant is under construction at Stanton, North Dakota, and another similar size plant is planned in Wyoming. Also, two Basin-owned transmission lines are under construction in North and South Dakota.

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[28] The coal mining companies will introduce much larger equipment to supply the new demand. Drag lines, now as small as 28 cubic yards, will remove the overburden in single bites of 100 cubic yards. Bottom dump haulage units with 100 cubic yard capacities will be used to carry the coal to conventional loading tipples. Now haulage units of half of this capacity are being used.

Table 4.5 PROPOSED ADDITIONAL LIGNITE MINING, MERCER COUNTY

Company	Location	Estimated Coal Output	Estimated Acres/year Mined to Obtain Coal
Consolidation Coal Co.	Stanton	2,500,000	240[a]
Knife River Coal Co.	Beulah	5,000,000	320[b]
North American Coal Co.	Beulah	10,000,000	510[a]
Total		17,500,000	1,030

[a] Data obtained from company representative.

[b] Estimated acres mined to obtain coal approximated using the following assumptions:

1. A lignite density factor of 1,750 tons per acre-foot.
2. The average mined lignite bed is 10 feet thick.
3. The mining operation receives 90 percent of the lignite.

The assumptions were provided by the Lewis and Clark 1805 Regional Council for Development.

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Table 4.6 EMPLOYMENT RESULTING FROM BASIN's 440-MW PLANT

Year Months from start	1971 0	1972 6	1972 12	1973 18	1973 24	1974 30	1974 36	1975 42	1975 48	1976 54	Steady State 1980's
Construction	----	----	----	----	----	800	825	231	0	----	------
Plant Operation	----	----	----	----	----	10	10	20	20	----	20
Mine Operation	----	----	----	----	----	----	75	75	75	----	75

Source for construction and plant employment operation: Basin Electric
Source for mine operation employment: Consolidation Coal.

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Table 4.7 EMPLOYMENT RESULTING FROM MICHIGAN WISCONSIN'S GASIFICATION FACILITY

Year	1976	1977	1977	1978	1978	1979	1979	Steady State
Months from start	0	6	12	18	24	30	36	1980's
Construction	0	1,300	2,480	3,435	2,585	330	0	------
Plant Operation	0	0	29	51	94	346	721	721
Mine Operation	0	0	0	0	150	300	300	300

Source for construction employment: Booz Allen & Hamilton, "Procedures Manual".

Source for operation employment: Michigan Wisconsin, "Coal and Water for Future Gasification" (1973 for total employment; "Procedures Manual" for prorating build-up in working force.

Table 4.8 EMPLOYMENT RESULTING FROM MDU'S 440-MW PLANTS

Year Months from Start	1975 1	1975 6	1976 12	1976 18	1977 24	1977 30	1978 36	1978 42	1979 48	1979 54	1980 60	1980 66	1981 72	1981 78	1982	1982	1983	1984	Steady State 1980's
Plant # 1																			
Construction	0	66	132	181	231	365	500	540	588	565	316	0	0	0	0	0	0		
Plant Operation	0	6	6	6	6	6	10	20	10	20	78	55	55	55	55	55			55
Mine Operation	0	0	3	0	0	0	0	0	0	38	75	75	75	75	75	75			75
Plant # 2																			
Construction	0	0	0	0	0	66	132	181	231	365	500	540	588	565	316	0			
Plant Operation	0	0	0	0	0	3	3	3	3	3	5	5	5	7	27	55			55
Mine Operation	0	0	0	0	0	0	0	0	0	0	0	0	0	38	75	75			75

Source for construction employment: Peak construction, mine construction, timing of the project, and prorating of the work force was taken from Dalsted et. al. The distribution by 6-month intervals was the average between two yearly estimates in Dalsted

Source for operation employment: Montana Dakota Utilities (MDU) employe.

Table 4.9 TOTAL EMPLOYMENT RESULTING FROM PLANNED FACILITIES

Company	Location	Construction Start	Construction End	Peak Construction Work Force	Peak Construction Year	Scheduled Date of Operation	Operating Work Force Mine	Operating Work Force Plant
Basin	Stanton	1971	1975	825	1974	April 1975	75	20
Michigan Wisconsin Pipe Line	Beulah	1976	1979	3,435	1978	1979	300	721
Montana Dakota Utilities								
Number 1	Beulah	1975	1980	588	1979	1980	75	55
Number 2	Beulah	1977	1982	588	1981	1982	75	55
							Total Operating Work Force	= 1,376

Source: Tables 4.6, 4.7, and 4.8

Consolidation Coal Company

Consolidation Coal Co. is a wholly-owned subsidiary of Continental Oil Co. It operates seven coal mining divisions, including the Western division at Englewood, Colorado. The firm contributed $16.6 million to Continental's 1972 income. Other divisions include a barge line on the Ohio River and an engineering firm in Ohio.

Knife River Coal Co.

Knife River Coal Co., Bismarck, North Dakota, is the oldest active coal mining firm in the State. Founded in 1923, the firm has mines in Mercer and Bowman Counties, North Dakota and Savage County, Montana. It is a wholly-owned subsidiary of Montana-Dakota Utilities Co.

It employs 100 people in North Dakota and 17 in Montana with an annual payroll of $840,000.

Michigan Wisconsin Pipe Line Co.

Michigan Wisconsin Pipe Line Co., Detroit, Michigan, is a subsidiary of American Natural Gas Co. It was founded in 1945. It transmits, wholesales, and stores natural gas in eight states: Michigan, Wisconsin, Illinois, Indiana, Kansas, Missouri, Ohio and Tennessee. It has 9,000 miles of pipeline and serves 53 retailers of natural gas. In 1972 it had a net income of $37.0 million.

It employs 619 people.

Montana-Dakota Utilities Co.

Montana-Dakota Utilities Co., Bismarck, North Dakota, offers natural gas and electric service in North Dakota, South Dakota, Montana, and Wyoming. The firm provides electricity for 84,500 customers and a total of 246 communities in North Dakota, which accounts for 58 percent of their sales. It provides gas for 123,388 customers.

MDU has nine electrical generating facilities: Beulah, Mandan, Williston, Ellendale, Signey, Glendive, Mobridge, Big Stone, and Rivertown in the Dakotas, Montana and Wyoming.

It employs 1,600 people with an annual payroll of $12.5 million.

North American Coal Company (NACCO)

North American Coal Co., Cleveland, Ohio, is the largest independent coal mining operator in the United States. The company was founded in 1913 as the Cleveland and

Western Coal Co. The name was changed in 1925. It has mines in Pennsylvania, Ohio, and North Dakota. Reserves are estimated at four billion tons.

The firm has been active in North Dakota since 1957, when NACCO acquired Dakota Collieries Company, a North Dakota producer. The firm has actively mined in Mercer County since that year.

It employs 4,400 people.

United Power Association Cooperative

United Power Association Cooperative, Elk River, Minnesota, is a wholesale power supplier for a federation of Minnesota and Wisconsin area power supply cooperatives. United serves 19 member distribution cooperatives in north and central Minnesota and northwest Wisconsin. United owns a 230 kilowatt transmission line from Stanton to Grand Forks, North Dakota, where it ties in with a Minnesota distribution system. In addition to the Stanton 216 MW plant, it owns a 40 MW plant at Elk River, Minnesota.

CHAPTER V

Employment, Population and Private Sector Impacts of Permanent Population

The projected coal development will affect the size and distribution of the permanent or mid-1980's work force and population in Mercer County. This chapter estimates the effect of the development on the following activities: employment, population, income, and private expenditures on housing and retail goods.

Employment Impact

Employment may be divided into export and service categories. The 1,376 additional employees resulting from lignite development are all classified as export employees.[29] The service employment stimulated by the export employment is estimated to be approximately 2,064[30] (Table 5.1). The number of service employees is based on the total employment multiplier of 2.50 prevailing in Economic Area 93 in 1966.[31] The total employment multiplier for Mercer County in 1970 was 2.22.[32] However we have assumed that the total employment multiplier in Mercer County would approximate the regional average of 2.50 as the level of services increases to satisfy the demands of the new residents.

The total export employment in the 1980's combines the 1970 export employment of 955 and the lignite development employment of 1,376 to give a total of 2,331 (Table 5.2).[33] The total service employment in the 1980's is estimated to be 3,232. It combines the 1970 service employment of 1,168 and the lignite development service employment of 2,064.

Total employment in the early 1980's is estimated to be 5,563. It combines the estimated total 1970 employment of 2,123 and the lignite development employment of 3,440. The development of lignite is estimated to increase total employment by approximately 160 percent of the 1970 employment. It would reverse the decreasing trend in total employment which began in the early 1950's with completion of Garrison Dam.[34]

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[29] Export employees are those persons whose income results from selling their product outside of Mercer County. They work in the following industrial groupings–agriculture, mining, manufacturing, railroads, utilities, wholesale, State and Federal Governments, and Armed Services.

[30] Service employees are those persons whose income results from selling their product or service inside Mercer County to the export employees. Service employees work in the following industrial groupings–retail, education, local government, professional services, and construction.

[31] See Appendix B for the economic rationale behind the employment multiplier.

[32] 1970 Census of Population.

[33] We have assumed that the 1970 employment would not decline during the 1970's.

[34] Without the economic stimulation from Garrison Dam, the total employment would have continuously decreased since the 1930's.

Table 5.1 CUMULATIVE EXPORT AND SERVICE EMPLOYMENT STIMULATED BY LIGNITE DEVELOPMENT IN MERCER COUNTY, 1974-1984

Year	Coal	Electricity	Gas	Subtotals[a]	Service Employment[b]	Total Employment[c]
1974	0	10	0	10	0	10
1975	75	18	0	93	15	108
1976	75	23	0	98	139	237
1977	75	26	29	130	141	271
1978	225	28	73	326	195	521
1979	413	73	534	1,020	489	975
1980	450	76	721	1,247	729	1,976
1981	488	81	721	1,290	1,870	3,160
1982	525	116	721	1,362	1,935	3,297
1983	525	130	721	1,376	2,043	3,419
1984	525	130	721	1,376	2,064	3,440

[a] Compiled from tables in Chapter IV.

[b] The service employment would lag 1 to 2 years behind the export employment

[c] Not all residing in Mercer County.

Table 5.2 ESTIMATED PERMANENT EMPLOYMENT IN MERCER COUNTY, 1980's

	Export	Service	Total
1970	955	1,168	2,123
Lignite Development	1,376	2,064	3,440
Totals	2,331	3,232	5,563

Sources: State Employment Security Commission for 1970 data and Table 5.1.

Table 5.3 1970, NEW AND TOTAL EMPLOYED RESIDENTS DISTRIBUTED IN MERCER COUNTY UNDER THE URBAN AND RURAL CONCENTRATION ASSUMPTIONS

Area	1970 Employed Residents	New Employed Residents		Total Employed Residents	
		UCA[a]	RCA[b]	UCA[a]	RCA[b]
Rural	992	135	821	1,127	1,813
Beulah	495	1,333	995	1,828	1,490
Hazen	439	1,160	841	1,599	1,280
Stanton	197	109	80	306	277
Total	2,123	2,737	2,737	4,860	4,860

[a] Urban Concentration Assumption

[b] Rural Concentration Assumption

Source: 1970 Employed Residents based on data from State Employment Securities Commission. New Employed Residents based on gravity model calculations (Appendix C).

Population Impact

Residential Location of Employees. The residential location of employees is difficult to estimate in the absence of data on the personal preferences of new employees. Certainly, some of these employees would choose to live outside Mercer County. A few employees would probably live in McLean County towns like Underwood and Washburn and in Oliver County. Others would commute the distance between Mercer County and Bismarck-Mandan. In the absence of the necessary information, we have assumed that approximately 80 percent of the employees (2,737) would live in Mercer County[35] and that 20 percent would live outside Mercer County.[36]

Also, the residential distribution of export and service employment within the County is difficult to estimate without information about how the private and public sectors will respond to the lignite development. Private provision of new single and multi-family homes and mobile park sites will be a principal determinant of the location of new residents. Equally important is how Mercer County will zone its land area for development.

In the absence of a development plan and associated control over development, two different residential growth patterns were devised for the County. The two different patterns were based on assumptions about an urban-rural split. The *rural concentration assumption* is based on the proposition that 70 percent of the new export employees would live in population centers and 30 percent in rural areas.[37] It is derived from the urban-rural split in Economic Area 96 in 1970.[38] The *urban concentration assumption* is based on the proposition that 95 percent of the new export employees would live in population centers and 5 percent in rural areas. It is similar to the settlement pattern of new export employees in Jamestown, North Dakota, in the 1960's.[39]

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[35] Approximately 84 percent of the employees at the two existing coal electrification plants near Stanton live in Mercer County (see Appendix C).

[36] More than 20 percent would live outside the County if the distribution of industrial workers is similar to rural development in Hennepen County, Illinois. See Frank Clemente and Gene Summers, "Rural Industrial Development and Commuting Patterns," Center of Applied Sociology, University of Wisconsin, Madison. Working Paper RID 73.15. August 1973.

[37] A population center in Mercer County is defined as any incorporated area over 500 people. A rural area is incorporated areas smaller than 500 and the remainder of the County. The 500 population cut-off point was chosen because the cities in Mercer County of that size and greater appear to be the most viable units of government.

[38] 1970 Census of Population.

[39] Helgeson Delmer, and Maurice Zink, "A Case Study of Rural Industrialization in Jamestown, North Dakota." Fargo, North Dakota: North Dakota State University, Agricultural Economic Report, No. 95. 1973.

A simplified residential distribution technique, called the gravity model, is used to distribute new export employees from place of work to place of residence.[40] The gravity model assumes that new employees will choose their residential location based on the distance from the employment center to the towns and the population of towns. The drawing power of existing towns has been demonstrated to be inversely related to the commuting distance, because the greater the distance the fewer the workers who will commute. The drawing power has also been demonstrated to be proportionately related to the population of the towns because the level of services increases with population. Each factor, distance and population, is assumed herein to be of equal importance because the preference of new employees for shorter commuting times versus more shopping opportunities is unknown.

The residential location of service employees is determined in a different manner than the residential location of export employees. The service employees are assumed to reside either in the town in which they work or in the rural area. The residential location of service employees reflects either the urban or rural concentration assumption, but is not based on the gravity model.

The residential location of new employees (2,737) by area is displayed in Table 5.3. The development of the lignite resources will more than double the current number of employed people in Beulah and Hazen.

Households. The next step in the analysis is to estimate the population impact of the new employees and their families on the towns and rural area.

The number of new households in the community is not the same as the number of new employees. Virtually all export employees will be the first wage earner in the family, but a significant portion of the service employment will be second (or third) family wage earner. For the purpose of this analysis, 1.24 employees per household is taken as the basis for calculating the number of new households in various locations.[41] The ratio is similar to the ratio prevailing in neighboring areas and in the Southwest where energy related development is also occurring. The total number of new households will be approximately 2,207 units (Table 5.4).

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[40] The gravity model is explained in greater detail in Appendix C.

[41] 1970 Census of Population. The ratio is for Economic Area 93.

Table 5.4 HOUSEHOLD DISTRIBUTION IN MERCER COUNTY UNDER THE URBAN AND RURAL CONCENTRATION ASSUMPTIONS

Area	UCA[a]	RCA[b]
Rural	109	662
Beulah	1,075	802
Hazen	935	678
Stanton	88	65
Total	2,207	2,207

[a] Urban Concentration Assumption

[b] Rural Concentration Assumption

Source: Table 5.3; New employment divided by 1.24 employees per household.

Housing Units. The number of new housing units that will be required is projected on the basis of providing one of three types of housing units for each household plus a normal percentage of vacant units. In the population centers, the split among the various types of housing units is assumed to be 68 percent single family, 5 percent multifamily, and 27 percent mobile homes.[42] In the rural area the split among the various types of housing units is assumed to be 70 percent single family and 30 percent mobile homes. The vacancy rate for homeowner houses in North Dakota is 1.4 and for rental units is 8.3.[43] Of the single family and mobile homes, 68.4 percent are owner occupied while the remainder are rental units.

The demand for each type of housing under the urban and rural concentration assumptions is displayed in Table 5.5. The most striking difference is between housing units in the rural area under the two different assumptions. Under the rural concentration assumption there will be approximately 600 more housing units scattered about the County than under the urban concentration assumption.

Temporal Distribution of Housing. The temporal occupation of housing by permanent employees is a function of the arrival of the permanent workers and the availability of housing. Table 5.1 presents the data on the arrival of permanent employees and Table 7.7 presents the data on the availability of housing.[44] Essentially, we have estimated that the permanent housing would be built over a 42-month period beginning in 1975. The occupancy rate increases very rapidly between the 42nd and 54th months, which corresponds to the greatest percentage increase in the arrival of new permanent employees (Tables 5.6 and 5.7).

Total Population

New population in the population centers and rural area is estimated by applying an average household size to the projected number of households. The average household size for North Dakota in 1970 was 3.25.[45] This ratio rather than the ratio for Mercer County, which was 3.14 in 1970, is assumed to apply to the new households because Mercer County will become more like the other more populated counties.

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[42] Booz, Allen and Hamilton Inc., *op cit.*

[43] U.S. Department of Commerce, Bureau of Census, "1972 City and County Data Book."

[44] The discussion of the construction of permanent housing seemed to fit much more neatly with the overall discussion of construction activities.

[45] 1970 Census of Population.

Table 5.5 TOTAL HOUSING DEMAND DISTRIBUTED IN MERCER COUNTY UNDER URBAN AND RURAL CONCENTRATION ASSUMPTIONS

	Urban Concentration Assumption				Rural Concentration Assumption			
Area	Single	Multi-Family	Mobile	Total[a]	Single	Multi-Family	Mobile	Total[a]
Rural	79	----	33	112	489	----	197	686
Beulah	755	57	299	1,111	563	43	224	830
Hazen	656	50	260	966	476	37	189	702
Stanton	68	----	27	95	46	----	20	66
Total	1,558	107	619	2,284	1,574	80	630	2,284

[a] Including vacancy rate allowance.

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TABLE 5.6 CUMMULATIVE DISTRIBUTION BY YEAR AND AREA OF PERMANENT HOUSING IN MERCER COUNTY FOR EXPORT WORKERS UNDER UCA (URBAN CONCENTRATION ASSUMPTION)

Year Month from Start	1975 0	1975 6	1976 12	1976 18	1977 24	1977 30	1978 36	1978 42	1979 48	1979 54	1980 60	1980 66	1981 72	1981 78	1982 84	1982 90
Rural	0	0	1	2	3	8	11	29	62	96	100	103	103	106	111	112
Beulah	0	0	8	20	31	80	111	280	604	940	985	1007	1007	1041	1085	1111
Hazen	0	0	4	17	27	69	95	240	518	806	844	864	864	892	930	966
Stanton	0	0	1	2	3	7	9	23	49	77	80	82	82	85	87	95
Total	0	0	16	40	64	164	226	572	1233	1919	2009	2056	2056	2124	2215	2284

Source: Tables 4.9 and 7.7.

Table 5.7 CUMULATIVE DISTRIBUTION BY YEAR AND AREA OF PERMANENT HOUSING IN MERCER COUNTY, FOR EXPORT WORKERS UNDER RCA (RURAL CONCENTRATION ASSUMPTION)

Year Month from Start	1975 0	1975 6	1976 12	1976 18	1977 24	1977 30	1978 36	1978 42	1979 48	1979 54	1980 60	1980 66	1981 72	1981 78	1982 84	1982 90
Rural	0	0	5	12	19	49	68	111	370	575	603	617	617	637	664	686
Beulah	0	0	6	14	23	59	81	206	443	690	723	740	740	765	797	830
Hazen	0	0	5	12	20	51	70	177	382	595	623	634	634	628	627	408
Stanton	0	0	0	1	2	5	7	17	37	58	60	62	62	64	67	60
Total	0	0	16	40	64	164	226	571	1232	1918	2009	2056	2056	2124	2215	2284

Source: Tables 4.9 and 7.7.

The total new population is projected to be approximately 7,200 (Table 5.8). Again the urban concentration assumption would result in most of the new population in the population centers, whereas the rural concentration assumption would result in a sizeable amount of the population diverted to the rural area.

Total population in the population centers and rural area in the mid-1980's is the sum of the lignite development population and the 1970 population (Table 5.9). Lignite development is estimated to double the 1970 County population and more than triple the populations of Beulah and Hazen under the urban concentration assumption.

*Temporal Distribution of Population.*On the basis of housing occupancy, we have estimated the temporal distribution of population, i.e., the year the population centers and rural area receive new people (Tables 5.10 and 5.11). As would be expected, the greatest population increase occurs between the 42nd and 54th months. The arrival time of the new population will be an important consideration when we consider the combined impact of the construction population and permanent population in Chapter VIII.

School Population

The added school enrollment in public schools is projected under both urban and rural concentration assumptions. Of the current State population, 19 percent are enrolled in elementary schools and 7 percent are enrolled in high schools, and these percentages are assumed to apply to the new population in Mercer County.[46] The population centers' school enrollment is assumed to occur in the city school districts in which the population resides, and the rural area school enrollment is assumed to occur somewhere in the eight "rural districts".[47] The new enrollment resulting from lignite development is projected to add almost 1,900 new students or approximately 2.35 times the number of students enrolled in 1973 (Table 5.12).[48] Both urban and rural concentration assumptions would

[46] 1970 Census of Population.

[47] There is no analysis of the impact of the rural school enrollment on school districts because of the tenuous nature of such projection. Some of the rural school enrollment may even occur in the Beulah, Hazen, and Stanton school districts because they encompass areas much larger than city boundaries.

[48] Actually the number of school children in the new population may be slightly higher than our estimate because most of the new population will be between 20 and 40 years of age and will contain few people over 65 years of age. In order to check the reasonableness of our estimate, we calculated two alternative estimates based on different sources.

One alternative estimate was based on the number of married people in the population (77.5 percent) and number of children per family (1.48). The number of new families in Mercer County in 1980 is estimated to be 1,700 and the number of school children would therefore be 1,965. The data for this calculation were national averages taken from U.S. Bureau of Census, "The Methods and Material of Demography," 2nd printing, 1973, Chapter 10.

Another alternative estimate was based on the number of children (.9) per household. The number of new households in Mercer County in 1980 is estimated to be 2,207 and the number of school children would therefore be 1,986. The data for this were taken from the community impact study prepared by Corps of Engineers for the Langdon area.

Thus we may have underestimated the additional school population by five percent.

Table 5.8 POPULATION PROJECTIONS FOR MERCER COUNTY UNDER URBAN AND RURAL CONCENTRATION ASSUMPTIONS

Area	UCA[a]	RCA[b]
Rural	354	2,151
Beulah	3,494	2,607
Hazen	3,039	2,204
Stanton	286	211
Total	7,173	7,173

[a] Urban Concentration Assumption

[b] Rural Concentration Assumption

Source: Table 5.4 and 3.25 people per household.

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Table 5.9 CURRENT AND PROJECTED POPULATION DISTRIBUTED AMONG THE POPULATION CENTERS AND THE RURAL AREA

	1970 Population	1980 Lignite Development Population		Total Population 1980	
		UCA[a]	RCA[b]	UCA[a]	RCA[b]
Rural	3,074	354	2,151	3,428	5,225
Beulah	1,344	3,494	2,607	4,838	3,951
Hazen	1,240	3,039	2,204	4,279	3,444
Stanton	517	286	211	803	728
Total	6,175	7,173	7,173	13,348	13,348

[a] Urban Concentration Assumption

[b] Rural Concentration Assumption

Sources: Table 3.12 and Table 5.8.

Table 5.10 CUMULATIVE DISTRIBUTION BY YEAR AND AREA OF PERMANENT POPULATION IN MERCER COUNTY UNDER UCA (URBAN CONCENTRATION ASSUMPTION)

Year Month from Start	1975 0	1975 6	1976 12	1976 18	1977 24	1977 30	1978 36	1978 42	1979 48	1979 54	1980 60	1980 66	1981 72	1981 78	1982 84	1982 90
Rural	0	0	3	6	9	25	35	91	195	301	314	323	323	333	348	352
Beulah	0	0	25	63	97	251	348	879	1896	3251	3092	3161	3161	3268	3406	3488
Hazen	0	0	22	53	85	216	298	753	1626	2530	2649	2713	2713	2800	2920	3032
Stanton	0	0	3	6	9	22	28	72	154	242	251	257	257	273	273	298
Total	0	0	53	128	200	514	709	1795	3871	6024	6306	6454	6454	6674	6947	7170

Source: Table 5.6.

Table 5.11 CUMULATIVE DISTRIBUTION BY YEAR AND AREA OF PERMANENT POPULATION IN MERCER COUNTY UNDER RCA (RURAL CONCENTRATION ASSUMPTION)

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Month from Start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Rural	0	0	16	38	60	154	213	537	1162	1805	1893	1934	1937	2000	2085	2154
Beulah	0	0	19	44	72	185	254	647	1390	2166	2269	2323	2323	2401	2500	2606
Hazen	0	0	16	38	63	160	220	556	1199	1868	1955	2000	2000	2066	2151	2204
Stanton	0	0	0	3	6	16	22	53	116	182	188	195	190	208	204	207
Total	0	0	51	123	201	515	709	1793	3867	6021	6305	6452	6450	6675	6940	7171

Source: Table 5.7.

Table 5.12 CURRENT AND PROJECTED SCHOOL DISTRICT ENROLLMENTS, MERCER COUNTY

School District	FY 1973			UCA [a]			RCA [b]			Total (UCA)			Total (RCA)		
	K-8	9-12	Total	K-8	9-12	Total	K-8	9-12	Total	K-8	9-12	Total	K-8	9-12	Total
Rural	169	99	268	68	25	93	409	151	560	237	124	361	578	250	828
Beulah	350	166	516	664	244	908	495	182	677	1,014	410	1,424	845	348	1,193
Hazen	324	173	497	577	213	790	419	154	573	901	386	1,287	743	327	1,070
Stanton	156	63	219	54	20	74	40	15	55	210	83	293	196	78	274
Total	999	501	1,500	1,363	502	1,865	1,363	502	1,865	2,362	1,003	3,365	2,362	1,003	3,365

[a] Urban Concentration Assumption.

[b] Rural Concentration Assumption.

Source: School enrollments for FY 1973 from North Dakota, "Educational Directory, 1972-1973" and for UCA and RCA, Table 5.9.

have their most noticeable impact on the rural school districts. If the rural concentration assumption is correct, then the added enrollment in those school districts would be six times greater than under the urban concentration assumption.

Private Sector Impacts

Housing Costs. Housing costs will depend upon the type of structure (single family, multifamily, or mobile) and the costs of structures, land, and support services. The types of structures were estimated in Table 5.5.

Construction costs for housing will, of course, depend upon the size and quality of the individual units. In this report, we have average costs based on current experience in North Dakota (Table 5.13).

Under both UCA and RCA the investment required for housing is approximately $62 million (Table 5.14).

Residential Land Use Requirements. Residential land usage projections are based on the number and type of dwelling units and the physical space needed to support each type of dwelling unit. The physical space requirements are .323 acre per single family unit, .135 acre per multifamily unit, and .173 acre per mobile home (Table 5.15). These requirements include land for public streets and access and support facilities as well as the housing unit *per se.* Total residential land usage based on the above requirements would be 626 acres under UCA and 691 under RCA (Table 5.16).

While the total land required for residential activity appears insignificant (less than one percent) when compared to the County land area, it is significant when compared to the current land use and availability of land in the population centers. For example, the current residential land usage in Beulah is 133 acres.[49] The projected increase in residential land usage could range from 227 acres under RCA to 304 acres under UCA. An expansion of that magnitude will be difficult in light of the surrounding topography, hills to the north end and Knife River flood plain to the south, and the problems of land acquisition. Similar land requirements and problems will probably be encountered in Hazen, but probably not in Stanton given the more limited residential land use requirements.

Income and Sales. New income in Mercer County as used herein is the sum of the export and service incomes generated by lignite development. Essentially, the export income spent in Mercer County generates income for those in the service sector. The spending of the

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[49] This estimate differs from the estimate of residential land usage in Chapter III because it includes land for public streets and access and support facilities.

Table 5.13 HOUSING COSTS

	Average Size (sq. ft.)	Cost Per sq. foot	Cost for Land and Services[a]	Costs/unit
Single Family	1,200	$25	$3,500	$33,500
Multifamily	800	20	2,000	18,000
Mobile Homes	960	12	3,000	14,500

[a] Cost includes raw land, water and sewer services, streets and gutters.

Source: Basin Electric Power Cooperative. "People's Housing Program."

Table 5.14 HOUSING INVESTMENTS IN MERCER COUNTY BY AREA UNDER URBAN AND RURAL CONCENTRATION ASSUMPTIONS

	UCA[a]			RCA[b]		
	Single Family	Multi-Family	Mobile	Single Family	Multi-Family	Mobile
Rural[c]	$ 2.4	$ - - -	$ 0.5	$15.2	$- - -	$ 2.9
Beulah	25.3	1.0	4.2	18.8	0.8	3.3
Hazen	22.0	0.9	3.8	15.9	0.7	2.7
Stanton	2.3	- - -	0.4	1.5	- - -	0.3
	$52.0	$ 1.9	$ 8.9	$51.4	$ 1.5	$ 9.2
Total	$62.0			$62.1		

[a] Urban Concentration Assumption

[b] Rural Concentration Assumption

[c] The rural single family unit cost for land and services are estimated to be $750 rather than $3,500.

Source: Tables 5.5 and 5.13.

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Table 5.15 RESIDENTIAL LAND USE REQUIREMENTS PER UNIT

	Single Family (Square Feet)	Multifamily (Square Feet)	Mobile Home (Square Feet)
Area Density[a]	10,000	3,500	5,000
Public Streets and Accers[b]	3,000	1,190	1,500
Churches, Schools,[b] Recreation and Other Public and Semi-Public Uses	850	1,000	425
Miscellaneous[b]	1,200	170	600
Gross Land Requirement per Dwelling Unit	14,050 .323 acre	5,860 .135 acre	7,525 .173 acre

[a] Area Density for single and multifamily based on proposed Mercer County Zoning Ordinances. Mobile home density based on assumption that 2 mobile home lots will be converted into 1 single family lot in the future.

[b] The other land requirements taken from "Mercer County Comprehensive Plan," 1968. The mobile home requirements are one-half the single family requirements.

5.16 CURRENT AND PROJECTED GROSS LAND REQUIREMENTS IN MERCER COUNTY
(Acres)

	1970	UCA[a]				RCA[b]			
Area	Total	Single Family	Multi-Family	Mobile	Total	Single Family	Multi-Family	Mobile	Total
Rural	N/A	26	--	6	32	158	--	34	192
Beulah	133	244	8	52	304	182	6	39	227
Hazen	139	211	7	45	263	154	5	33	192
Stanton	44	22	--	5	27	77	--	3	80
	N/A	503	15	108	626	571	11	109	691

[a] Urban Concentration Assumption

[b] Rural Concentration Assumption

Source: 1970 data are derived from current number of housing units times residential land use requirements (Table 5.15); UCA and RCA are derived from Tables 5.5 and Table 5.15.

initial round of service income generates additional service sector income. The total income multiplier reflects the cumulative service sector income. It is the ratio of total income (export plus service) to export income.[50]

The total income multiplier used in this report is 2.48 which is the total income multiplier for Economic Area 96. This multiplier is probably higher than the current income multiplier in Mercer County because Mercer County residents shop in regional trade centers. As the local economies mature, more local spending will occur in the County. However, we do not anticipate that the total income multiplier will exceed the regional average because existing centers outside the County will continue to dominate the area.

Total income is calculated by determining the export income and multiplying it by the total income multiplier. The export income associated with lignite development is expected to be around $13.3 million (Table 5.17). Total income is therefore $33.0 million (2.48 times $13.3 million).

Total retail sales in Mercer County are based on total gross income and the percentage thereof spent on retail items. The national average percentage spent on retail items is 52.3.[51] Thus, new retail sales in the 1980's would be 52.3 percent of $33.0 million or $18.2 million.

Wholesale sales are defined as the sales to retail outlets plus sales to the lignite development companies. The latter (company sales) are assumed to be minimal in Mercer County as stated earlier because the sales will take place in the regional service centers. The amount of wholesale trade associated with retail sales is also assumed to be minimal for the same reason.

Commercial Facilities. A considerable investment will also be required by the private sector to provide the necessary commercial facilities including retail, wholesale, office, hotel/motel, retail and recreation space. We estimate that a total investment of approximately $4.4 million will be required to provide the necessary retail facilities (Table 5.18).

The estimated expansion of commercial facilities must be interpreted with care because it assumes that the existing commercial facilities are operating at full capacity and that new facilities will be built to national standards. Our informal survey of commercial

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[50] See Appendix D for the economic rationale behind the income multiplier.

[51] Development Research Associates, "Housing and Community Services," April 1974, pp. III-17 to III-22.

Table 5.17 EXPORT INCOME TO BE GENERATED IN MERCER COUNTY BY LIGNITE DEVELOPMENT

Employment Type	Number of Employees	Average Wage	Total Wage
Coal Gasification	577	$12,600	$7,270,000
Utility	104	12,400	1,290,000
Mining	420	11,270	4,733,000
Total	1,101	$36,270	$13,293,000

Source: Company estimates.

Table 5.18 TOTAL NEW RETAIL SPACE REQUIRED IN MERCER COUNTY

Type of Sale	Percent of Retail Space	Sales/ Year (millions)	Sales/ Sq. Ft.	Total Retail Space	Cost/ Sq. Ft.	Total Cost (millions)
Food	18	$3.3	$151	22,000	$22	$0.5
Automotive	18	3.3	60	55,000	22	1.2
General Merchandise	9	1.6	88	18,000	22	0.4
Eating and Drinking	7	1.3	99	13,000	22	0.4
Gasoline Stations	7	1.3	164	8,000	22	0.2
Furniture and Home Furnishing	4	0.7	98	7,000	22	0.2
Building Material and Hardware	22	4.0	99	40,000	22	0.9
Appareal and Accessory	4	.7	104	7,000	22	0.2
Drug Stores	3	.5	99	5,000	22	0.1
Misc.	8	1.5	124	12,000	22	0.3
Total	100	18.2		187,000 sq. ft.		$4.4

facilities in Mercer County indicates that not all existing facilities are operating at full capacity.[52] Two large food stores utilize 140 square feet per $1,000 of sales, but another only 93 square feet per $1,000 of sales. While many drinking establishments utilize approximately 40 square feet per $1,000 of sales, some utilize only 30 square feet per $1,000 of sales. In both cases, the outlets do not utilize as much floor space as the national standards would indicate.

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[52] Survey conducted in August, 1974. The results of the survey are on file with Thomas E. Carroll and Associates.

CHAPTER VI

Public Sector Impacts of Permanent Population in Mercer County

The estimated permanent population for Mercer County in the mid-1980's will be approximately 13,300, or more than double the 1970 population of 6,200. The new total population will place demands on the public sector and will generate additional revenues to pay for those demands.

This chapter is an assessment of the public sector costs and revenues resulting from the new 1980's total population. The chapter is organized to examine the net impact of the population on the major services of State, county, and city governments and school districts.

At the outset, the tentative nature of the estimate must be acknowledged. The actual level of demand will be determined by where the population actually settles, rather than by the estimate derived from the gravity model. Certainly, some of the export employees will choose to live in incorporated cities in the County other than Beulah, Hazen, and Stanton and in counties other than Mercer. The actual level of demand for public services will be a function of the preferences of the new export employees. As an example, they may well demand (and pay for) more expenditures on police protection and education. The costs of providing public services are based on 1972-1973 cost data and professional judgments rather than detailed engineering calculations. Detailed estimates of costs would require engineering studies beyond the scope of this study and are certainly not warranted at this time. Lastly, the public revenues derived from lignite development and the associated population are based on the revenue mechanisms in place in 1972-1973 and not in the mid-1980's. The public revenues in the mid-1980's may well fall short or exceed the estimates, depending on such factors as a change in the tax exemptions for the development, State transfers of funds, and Federal revenue sharing.

State Costs and Revenues

The format of this analysis is to document the potential State expenditures, document the potential sources of revenues, and examine the net fiscal impact. The State examination is not as complete as the analysis of County and city government and school districts. We have not attempted to compile a composite State budget nor examine how every State program would be affected by lignite development in the County. Such an analysis would be based on very tenuous assumptions because the current population of Mercer County constitutes only one percent of the current population and the mid-1980's population will probably constitute only two percent of the State population.

Costs

The significant expenditures required of the State will be for the construction and maintenance of new State highways, for assistance to school districts, and for personal property replacement transfers to most taxing districts.

State Highways

State statistics show Mercer County with 90 miles of State highways (66 miles primary and 24 miles secondary).[53] This is approximately 1 mile of State highway for every 70 inhabitants.

Since no new centers of population are projected for the County, the current highway mileage is adequate to serve the current and projected population.[54] However, the traffic corridors among the population centers (State Highway 200 between Beulah and Stanton) and those carrying traffic to Bismarck and Manden (State Highways 49, 31, and 200A) must be improved and modified to handle the "average daily traffic" (ADT) associated with the new projected population. The precise type and location of changes, such as widening of shoulders, resurfacing, and intersection modification can only be determined by a detailed traffic study. As a surrogate, we consulted the *Highway Capacity Manual*, 1965[55] and detailed road conditions data recorded by the State Highway Department. The *Manual*'s capacity standards for rural highways indicate that the capacity of State highways is sufficient to accommodate the new population, and the detailed data reveal some of the necessary improvements to meet the ideal standard. As a proxy for specific changes we have assumed that general upgrading of the following segments would be representative of the actual needs:

Highway 31	6 miles	Rebuild existing highway
Highway 49	23 miles	Widen shoulder and resurface
Highway 200	17 miles	Widen shoulder and resurface
Highway X[56]	10 miles	Build new highway

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[53] North Dakota, State Highway Department, "North Dakota Highway Statistics," 1973, p. 4.

[54] The State highway plan indicates a need for 41 miles of additional highways in Mercer County. The need is based on serving a recreation oriented population which would use Lake Sakakawea. The estimate of need was prepared in the late 60's and did not take into account lignite development in the County.

[55] Highway Research Board, *Highway Capacity Manual*, 1965. Special Report No. 87.

[56] Highway X would connect the Michigan Wisconsin plant site to the junction of Highways 49 and 200 north of Beulah.

Highway construction (rebuilding) costs in 1972 dollars average $154,000 per mile for 52-feet-wide, 2-lane highways.[57] This type of highway is needed with an ADT greater than 400. Highway upgrading (widening shoulders and resurfacing) costs in 1972 dollars average $81,000 per mile.[58] These two costs estimates combined with their respective highway mileages yield an expected capital outlay of $5.7 million on State highways.

Highway maintenance costs for State highways currently average $1,100 per mile (Table 6.1).[59] The current annual costs of maintenance in Mercer County are estimated to be $101,000. If the State rebuilds or widens and resurfaces 79 miles of highways in Mercer County, maintenance costs would fall below their current level with the new population. However, if the State does not invest in the highways and there is severe weather damage, then the costs of maintenance would increase. Unfortunately, cost data were not available to estimate these increased costs.

The annual State highway costs depend on how many miles of highway construction (rebuild and upgrade) per year the State will annually fund in Mercer County. If the State aims to complete the proposed highway network by the mid 1980's (a five-year period), it would have to annually fund approximately $1 million of highway construction. If the State maintains the current 6 to 1 ratio of construction to maintain costs, it would spend $606,000 annually. In this case, the State would require ten years to complete the construction requirements. Thus the annual (construction and maintenance) costs could range from $707,000 to $1.2 million for the State Highway network in the County (Table 6.2).

State Assistance to School Districts

The State has two educational programs offering financial support to school districts. One, the State Tuition Fund, offers each school district a payment based on the number of children in the district from 6 to 21 years of age. The other, the State Foundation Program, allows the State to assist school districts according to their financial need and to supplement their bus transportation. In FY 1974, the State offered payments of $450-479 per average daily member (ADM) for educational payments in grades K-8, $713-$750 per ADM for educational purposes in grades 9-12, and $31 per ADM for transportation in all grades. The educational payments to the school district are reduced by a 21-mill county equalization fund, a 20-mill levy on district taxable value, and Federal assistance.

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[57] North Dakota, State Highway Department, "North Dakota Highway Statistics," 1973, p. 50.

[58] *Ibid.*

[59] *Ibid.*

TABLE 6.1 Mercer County Share of North Dakota Budget for FY 1972

Category	Receipts	Category	Expenditures	Surplus (Deficit)
General Fund:		General Fund:		
Sales and Use Tax[a]	$ 503,000	State Foundation[l]	$ 275,000	
Personal Income Tax[b]	255,000	Social Service Bureau[m]	84,000	
Corporate Income Tax[c]	40,000	Personal Property Replacement[n]	156,000	
Cigarette Tax[d]	71,000	All Other[o]	562,000	
Annual Electric Franchise Tax[e]	72,000			
Motor Vehicle Excise Tax[f]	68,000			
Other[g]	198,000			
SUBTOTAL	$1,207,000		$1,077,000	$130,000
Special:		Special:		
Income From State Lands[h]	$ 56,000	State Tuition Program[l]	$ 27,000	
Motor Vehicle Fuel Tax[i] Motor Vehicle Registration[j]	439,000	Highway (State)[p]	101,000	
		Highway (County and City)[q]	122,000	
Other[k]	895,000	Other[r]	747,000	
SUBTOTAL	$1,390,000		$ 997,000	$393,000
TOTAL	$2,597,000		$2,074,000	$523,000

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a. North Dakota Sales and Use Tax, State's Final Report, 1971 and 1972
b. Tax Department memo, July 1974. 1973 data pro-rated to 1972
c. State-wide per capita corporate income tax $6.50 times 6175 is the estimated county share (Appendix E)
d. State-wide per capita payment of $11.50 times 6175
e. Report from Tax Department
f. State-wide per capita payment of $11.00 times 6175
g. The per capita payment of $32.00 times 6175
h. Since Mercer County is 1.6 percent of the state land area. we have assumed it generates 1.6 percent of of the revenue.
i. Mercer County had 1.1 percent of the passenger cars and trucks registered in the state, so we assumed Mercer County generated 1.1 percent of the tax.
j. See "i", above.
k. The per capita share of $145.00 times 6175
l. Department of Public Instruction
m. Social Service Board
n. Office of Tax Commissioner
o. Per capita state expenditure of $191.00 times 6175

TABLE 6.1 Mercer County Share of North Dakota Budget for FY 1972 (Continued)

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p. "North Dakota Highway Statistics," 1973

q. "North Dakota Highway Statistics," 1973, p. 54. Federal Agency assistance is reduced to $34,000, which is the normal payment. This item is not included in the state budget.

r. Per capita state expenditure of $121.00 times 6175.

TABLE 6.2 Mid 1980's Mercer County Share of North Dakota State Budget

Category	Receipts	Category	Expenditures	Surplus (Deficit)
General Fund:		General Fund:		
Sales and Use Tax[a]	$ 1,079,000	State Foundation[l]	$ 1,109,000	
Personal Income Tax[b]	603,000	Social Service Bureau[m]	240,000	
Corporate Income Tax[c]	86,000	Personal Property Replacement[n]	237,000	
Cigarette Tax[d]	153,000	All Other[o]	1,210,000	
Annual Electric Franchise Tax[e]	242,000			
Motor Vehicle Excise Tax[f]	146,000			
Other[g]	426,000			
SUBTOTAL	$ 2,735,000		$ 2,796,000	($61,000)
Special:		Special:		
Income From State Lands[h]	$ 56,000	State Tuition Program[p]	$ 82,000	
Motor Vehicle Fuel Tax[i]	1,000,000	Highway (State)[q]	707,000-1,210,000	
Motor Vehicle Registration[j]		Highway (County and City)[r]	353,000	
Other[k]	1,928,000	Other[s]	1,690,000	
SUBTOTAL	$ 2,984,000		$ 2,832,000-3,335,000	$152,000-($351,000)
TOTAL	$ 5,989,000		$ 5,628,000-6,131,000	$361,000-($142,000)

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a. Calculated in text

b. Calculated in text

c. State-wide per capita of $6.50 in FY 1972, times 13,300. Actually, Mercer County's contribution will be much greater, given the location of the new facilities, but we do not know how to estimate its share.

d. State-wide per capita payment of $11.50 in FY 1972 times 13,300

e. Tables 6.1 and 6.27

f. State-wide per capita payment of $11.00 in FY 1972 times 13,300

g. State-wide per capita payment of $32.00 in FY 1972 times 13,300

h. Same as FY 1972

i. Total estimated highway tax receipts in the mid 1980's are estimated to be $56 million (Appendix F). Mercer County is estimated to have 1.7 percent of the registered vehicles in the State, so we have assumed that Mercer County generated 1.7 percent of the tax.

j. Same as "i" above

k. State-wide per capita payment of $145.00 times 13,300

l. Table 6.3

m. Calculated in text

n. Calculated in text

o. State-wide per capita expenditures of $91.00 times 13,300

p. Table 6.3

q. Calculated in text

r. Appendix F

q. State-wide per capita expenditure of $121.00 times 13,300

The total costs to the State for these programs are calculated for each school district later in this Chapter. The annual costs to the State of supporting three school districts in Mercer County in the mid-1980's total $1,109,000 (Table 6.3).[60]

State Assistance to County Welfare Board

The State contributes matching funds to supplement Federal social service programs administered by Mercer County. These programs include assistance for the aged, blind, and disabled, aid to families with dependent children, medical assistance, general relief, foster care, and general administration. In FY 1972, the total social service expenditures for all these programs in Mercer County were $397,000; of this, $273,000 (68.8 percent) were Federal funds, $84,700 (21.3 percent) were State funds, and $39,500 (9.9 percent) were County funds. Across all counties in North Dakota, the relative contribution of these units of government averaged 69.3 percent Federal, 23.4 percent State, and 7.3 percent County. Assuming that the State would contribute $3 for every $1 of expenditure by the Mercer County Welfare Board, the State contribution in the mid-1980's would be $240,000. (The increase in Mercer County expenditure is discussed in the next section.)

Personal Property Replacement

In 1969, the State of North Dakota abolished the personal property tax levied by all taxing districts and, to offset the loss in local revenue, substituted receipts from the four percent sales tax and business privilege tax. The amount of personal property replacement received by taxing districts is based on the amount of personal property tax collected in 1968 and on one-seventh of the increase (or decrease) in the real property tax collected in the current year over (under) the real property tax collected in 1968. The amount of personal property replacement which the State would pay Mercer County taxing districts in the mid-1980's is calculated under the appropriate taxing district. The payments to major taxing districts total $237,000.[61]

Revenues

The State derives revenue from many sources. The primary sources for the purposes of this analysis are taxes on corporate income, individual income, sales, highway related activities, and real property; income derived from school lands; and transfers from the Federal Government. We will briefly describe these sources, making numerical calculations where possible.

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[60] See Chapter V for discussion of rationale for selection of only three of ten school districts in Mercer County for analysis.

[61] The taxing districts in Mercer County receiving personal property replacement receipts are the state, park districts, cities, unorganized townships, water districts and rural fire districts.

TABLE 6.3 Selected State Payments to Taxing Districts and School Districts in Mercer County in Mid 1980's [a]

State Tuition Fund

School District	UCA[b]	RCA[c]	Average
Beulah	$ 43,000	$ 36,000	$ 39,000
Hazen	39,000	32,000	35,000
Stanton	9,000	8,000	8,000
TOTAL	$ 91,000	$ 76,000	$ 82,000

State Foundation Program

School District	UCA[b]	RCA[c]	Average
Beulah	$ 593,000	$ 476,000	$ 535,000
Hazen	501,000	414,000	458,000
Stanton	119,000	113,000	116,000
TOTAL	$1,213,000	$1,003,000	$1,109,000

State Personal Property Replacement

	UCA[b]	RCA[c]	Average
Mercer County[d]	$ 173,000	$ 173,000	$ 173,000
City of Beulah[e]	35,000	29,000	32,000
City of Hazen[e]	32,000	25,000	28,000
City of Stanton[e]	4,000	3,000	3,000
TOTAL	$ 244,000	$ 230,000	$ 237,000

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a. Data taken from respective tables later in Chapter

b. Urban concentration assumption

c. Rural concentration assumption

d. Includes unorganized township personal property replacement

e. Includes the city park district personal property replacement

Corporate Income and Business Privilege Taxes

Coal mining and coal gasification companies, and investor-owned utilities are subject to the current income and business privilege tax provisions; however, rural electric generating cooperatives are not. The revenues from these taxes are placed in the State general fund. Data are not available to calculate the potential return to the State.

Personal Income Tax

The State adopted a graduated personal income tax in 1923. The income tax rates effective for the 1973 are as follows:

Taxable Income:	Tax:
Up to $1,000	Computed at 1%
$1,000 to $3,000.....$10.00 plus	2% of excess over $1,000
$3,000 to $5,000.....$50.00 plus	3% of excess over $3,000
$5,000 to $6,000.....$110.00 plus	5% of excess over $5,000
$6,000 to $8,000.....$160.00 plus	7½% of excess over $6,000
Over $8,000 ....$310.00 plus	10% of excess over $8,000

The State Taxation Department has calculated the effective State tax rate for a 12-County area (including Mercer) for 1973. The data included computation of the Federal adjusted gross income and the effective tax rate applied thereto for 11 occupations. The effective tax rate is approximately 1.1 percent for craftsmen, laborers, proprietorship, clerical, and sales.

The adjusted gross income received by the new employees in Mercer County is estimated to be $33.0 million, and the State income tax payment is estimated to be $348,000.[62] The tax payment of the present population in FY 1972 was $255,000. The total tax payment would be $603,000.

Sales and Use Taxes

Coal mining and coal gasification companies, investor-owned utilities, and rural electrical cooperatives are presently subject to a one-time sales or use tax on the cost of all production equipment when purchased for use in the State. However, if the machinery and equipment are purchased and taxed out-of-state, the company would receive a use tax credit. This tax is not estimated because it would not be an annual receipt.

The sale of outputs of certain types of facilities is also subject to sales tax. Investor-owned utilities and rural electrical cooperatives collect a sales tax on all electricity sold to

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[62] There will be 1,233 export employees with a total income of $13.3 million, and 1,504 service employees with an income of $19.7 million. Ninety-six percent of this total is assumed to be their adjusted gross income.

North Dakota residents. The amount collected cannot be estimated at this time because we do not know how much electricity from the new plants will be sold in the County. Coal companies would not collect sales taxes on coal sold to coal gasification or electrification plants since the coal is considered a "raw material" for further processing. Coal gasification plants would not be required to collect sales tax on their final product since it is a combustible fuel and therefore exempt from sales tax.

Retail sales, except for food, food products, labor, services, and drugs are subject to the four percent sales tax. The new retail sales in the mid-1980's are estimated to be $18.2 million. Allowing for exemptions of $3.8 million, the annual sales tax collected is estimated to be $567,000.[63] The FY 1972 sales tax payment in Mercer County was $503,000.[64] The total sales tax payment in the mid-1980's would be $1,079,000.

Co-op Replacement

Electric cooperatives pay a two percent gross receipts tax to the State which retains a portion of the payment. In 1972, Basin Electric and UPA paid $260,000 in gross receipts taxes, of which $72,000 was credited to the State general fund. The expansion of the Basin Electric plant is estimated to generate revenues of $170,000 for the State.[65] Present and projected payments to the State would total $242,000.

State Highway Revenues

Highway system costs are financed, for the most part, from highway taxes and Federal aid. North Dakota's State Highway Department received on account of Mercer County $439,000 from motor vehicle taxes and $296,000 from Federal aid. Assuming that the number of automobiles registered by total population (13,300) would increase the amount of highway tax generated and that the total population would not have any significant effect on Federal aid, the State Highway Department would receive an annual revenue of $1.0 million on account of Mercer County.[66]

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[63] Table 5.16 lists total new retail sales of $18.2 million. Food and drug items account for $3.8 million.

[64] Tax Department, "North Dakota Sales & Use Tax Statistical Report," 1971 and 1972.

[65] The basis for this number will be explained in a later section of this chapter.

[66] Federal aid would not noticeably increase with an increase in Mercer County population. The Federal aid received by North Dakota is a function of the ratio of its total area, population and rural and star route postal mileage to those of all States. Mercer County's small population increase in relation to total State population would have little effect on the ratio.

Income Derived from School Lands

This source consists of interest and income realized on the school lands, which includes returns from oil leases, bonuses, and investments made by the Board of University and School Lands. The amount of income will not change as a result of lignite development unless lignite is mined on school lands.

Revenues Versus Costs

General Services. Mercer County's share of the general fund receipts is estimated to have been $1.2 million and its share of general fund expenditures is estimated to have been $1.1 million, thereby resulting in a small net surplus for the State. By the mid-1980's, Mercer County is estimated to pay $2.7 million into the general fund and to stimulate $2.8 million in general fund expenditures, thereby resulting in a small net deficit. The significant increase in receipts will be the personal income tax and the annual electric franchise tax, which is limited to the rural electric generating cooperatives. The significant increase in expenditures will be the State foundation program. However, that increase is a function of the greatly enlarged State foundation program, as well as the increase in school enrollment associated with the new population. The net deficit would probably change to a surplus condition if we could obtain an accurate estimate of the corporate income tax payment.

Special Services. Mercer County's FY 1972 share of special fund receipts is estimated to have been $1.4 million and its share of special fund expenditures is estimated to have been $1.0 million or a $393,000 surplus primarily because of limited State expenditures on State and County highways. Mercer County's annual mid-1980's share of special fund receipts is estimated to be $3.0 million and its share of special fund expenditures is estimated to be between $2.8 and $3.3 million. Its activities could result in a budget condition ranging from a $152,000 net surplus to a $351,000 net deficit. The primary determinate of the net result is the level of State investment in highways. In the long run, by the late 1980's, the budget ought to be in a surplus condition because the State would no longer have to make a large investment in highways.

County Costs and Revenues

Major capital and maintenance expenditures that would be required of the Mercer County Board of Commissioners as a result of the proposed development include the following: general government, sheriff's office, other protection, health and sanitation, relief and charities, educational administration, roads, library, and hospital. Services related to agriculture, such as the county agent, water resource development and weed control, and miscellaneous functions, such as veterans' service officer, will not be noticeably affected by development and thus will not be discussed below.

The analysis of the County government examines the costs and revenues of expanding county services to accommodate the new residents. The format of the analysis is to (a) establish the capital (debt service) and operation and maintenance (O&M) costs of a new level of service for the total population in the mid-1980's, (b) establish the revenues generated by the total population in the mid-1980's, and (c) measure the net fiscal impact.

Costs

General Government. General government includes functions such as County administration, judicial activities and record keeping. There may be limited economies of scale for some of these activities, as the served population increases but not enough to significantly affect the per capita cost.[67] Thus the increase in County population from 6,200 to 13,300 would increase the total cost of general government from $118,000 to $253,000. (Tables 6.4 and 6.5).

Sheriff's Office (Rural Operations Only). The sheriff's force is adequate for the present rural population. A sheriff and three deputies, who have the capacity to serve approximately 3,700 people, currently serve an existing population of 3,100; the physical office space (1,500 square feet) meets the needs of the force. However, the jail which serves the total county population is inadequate for the reasons described in Chapter III.

The sheriff's force would have to expand as a result of lignite development. While the number of deputies would not have to increase under the Urban Concentration Assumption (UCA) because of a gain of only 300 people in the rural area, the number would have to increase under the Rural Concentration Assumption (RCA) because of a population gain of 2,200. Current standards would require about three more deputies if the mid-1980's rural population were 4,600. This increase in staff would require budgeting between $12,000 and $14,000 for each deputy's salary and automobile allowance.[68] In addition, the physical office space would have to be expanded and the jail renovated. No estimate was made on the cost of physical facilities for this report because the Lewis and Clark 1805 RC&D is

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[67] There are only two recent studies of County government costs in North Dakota. One is by Robert Belter, "County Government Costs in North Dakota," M.S. Thesis, North Dakota State University, 1970; the other is by Gordon Myer, Jr., "Economies of Size of County Government," M.S. Thesis, North Dakota State University, 1973. Both studies show only limited economies of scale as County population increases. For example, the 1971 Mercer County cost of treasurer was $2.19 per capita; the 1971 Ramsey County (population 12,915) cost was $1.64 per capita. The 1971 Mercer County total expenditure was $74.50 per capita; the Ramsey County total expenditure was $80.71 per capita (Mercer County did not include Sheriff).

[68] In some rural counties the deputy is paid a mileage allowance for operating his own car, rather than having a car provided by the County.

TABLE 6.4 Composite Budget for Mercer County for FY 1972

Category	Receipts	Category	Expenditures			Surplus
			Capital	O & M	Total	
Real Property Tax	$113,000	General Government	$ --	$118,000	$118,000	$
Personal Property		Sheriff	--	71,000	71,000	
Replacement	73,000	Protection	--	25,000	25,000	
Co-op Receipts	66,000	Health and Sanitation	--	8,000	8,000	
Other Federal Funds	47,000	Relief and Charities	--	40,000	40,000	
Miscellaneous	17,000	Educational Administration	--	7,000	7,000	
SUBTOTAL	$316,000	Other Special Services	--	22,000	22,000	
			$ --	$291,000	$291,000	$25,000
County Roads and Bridges	$ 313,000	County and Township Roads	$ 304,000	$ 93,000	$ 397,000	$
Motor Vehicle and Gas Tax	121,000					
SUBTOTAL	$434,000		$304,000	$ 93,000	$397,000	$37,000
Library	$ 9,000	Library	$ --	$ 10,000	$ 10,000	$
SUBTOTAL	$ 9,000		$ --	$ 10,000	$ 10,000	($ 1,000)
TOTAL	$759,000		$304,000	$394,000	$698,000	$61,000

TABLE 6.5 Composite Budget for Mercer County for Mid 1980's

Category	Receipts	Category	Capital	O & M	Total	Surplus (Deficit)
Real property Tax	$ 248,000	General Government	$ --	$253,000	$ 253,000	$
Personal Property		Sheriff	--	89,000	89,000	
Replacement	92,000	Protection	--	53,000	53,000	
Co-op Receipts	66,000	Health and Sanitation	--	13,000	13,000	
Revenue Sharing	213,000	Relief and Charities	--	80,000	80,000	
Miscellaneous	38,000	Educational Administration	--	27,000	27,000	
		Other Special Services	--	22,000	22,000	
SUBTOTAL	$ 657,000		$ --	$537,000	$ 537,000	$120,000
County Roads and Bridges	$ 287,000	County and Township Roads	$301,000 - $1,221,000	$106,000	$407,000 - $1,327,000	$
Motor Vehicle and Gas Tax	258,000					
SUBTOTAL	$ 545,000		$301,000 - $1,221,000	$106,000	$407,000 - $1,327,000	$138,000 or ($782,000)
Library	$ 35,000	Library	$ --	$ 37,000	$ 37,000	
SUBTOTAL	$ 35,000		$ --	$ 37,000	$ 37,000	($ 2,000)
TOTAL	$1,237,000		$301,000 - $1,221,000	$680,000	$981,000 - $1,901,000	$256,000 or ($664,000)

preparing a detailed cost estimate.[69] Consequently, the mid-1980's estimated cost of sheriff services under RCA is limited to a salary increase of $36,000, or a total budget of $107,000.[70]

Other Protection. Protection to persons and property other than by the sheriff's office includes a diversity of function, such as registrar of deeds, workmen's compensation insurance, insanity board, juvenile officer, and mental health unit. A percentage increase in funding as large as the percentage increase in County population will not be necessary for activities such as registrar of deeds and workmen's compensation insurance, if Mercer's experiences parallels those in other areas affected by development. However experience indicates that a percentage increase in funding larger than the percentage increase in County population will be necessary for activities such as the juvenile office and mental health unit. Since we do not have precise information on the increase in demand for these various services, we have assumed that the per capita cost of the aggregated services would remain the same and would increase with the change in County population. Thus. the increase in County population from 6,200 to 13,300 would increase the total cost of protection from $25,000 to $53,000.

Health and Sanitation. Health and sanitation service costs to Mercer County government are limited to the salary of the public health nurse. The per capita cost in FY 1972 for this service was $1. The per capita cost in counties with populations comparable to Mercer's projected population is usually $1.[71] Thus, the increase in County population from 6,200 to 13,300 would increase the cost from $8,000 to $13,000.

Relief and Charities. Relief and charities include assistance to the aged, blind, disabled, and to families with dependent children, medical assistance, general relief, foster care, and administration of a social work program. The FY 1972 County per capita cost was $2 for assistance payments and $4 for social work.

The per capita cost in counties with populations comparable to Mercer's projected population ranges from $4 to $8 per capita.[72] Since there is no empirical evidence to support either economies of scale or increasing demand for services as population increases, the per capita cost is assumed to remain at $6. Thus, an increase in County population from

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[69] Personal communication with John O'Leary, Lewis & Clark 1805 RC&D, August, 1974.

[70] The actual 1980's budget entry is only $89,000, because the 1980's budget represents both UCA and RCA costs, and $89,000 is the average of the estimates for the two assumptions.

[71] Ramsey and Barnes Counties' per capita cost was $1; McLean County's per capita cost was $2.

[72] Ramsey County's (population 12,915) per capita cost was $4 and McLean County's (population 11,251) per capita cost was $8.

6,200 to 13,300 would increase the cost of relief and charities from $40,000 to $80,000.

Education. Educational cost to County government is limited to the office of the County Superintendent of Schools. The FY 1972 per capita cost for this service was $1. The per capita cost in counties with populations comparable to Mercer's projected propulation is approximately $2.[73] Thus, the increase in County population from 6,200 to 13,300 would increase the cost of educational administration from $7,000 to $27,000.[74]

County Roads. Mercer County provides two types of roads. One network is 317 miles of County roads; 206 miles are County Federal-Aid roads and 111 are regular County roads. Of these, only 17 miles are paved.[75]

County road investment is confined to upgrading the existing network rather than adding new highway miles. (Only with new population centers would there be a potential need for additional mileage.) However, those roads which become major thoroughfares for the residential population must be improved and modified. The extent of the changes depends upon whether the urban or rural concentration assumption is correct, and the distribution of the rural population within the County. Under the UCA, only 350 people would reside outside the population centers, but under the RCA, 2,200 people would reside outside the population centers.[76] As an approximation of the impact of the new population under UCA, we have assumed that County road upgrading would be confined to re-paving the existing 17 miles of County road. As an approximation of the impact of the new population under RCA, we have assumed that the County roads would be upgraded to a standard similar to that adopted by Mountrail County, which has comparable terrain to Mercer County. Approximately 50 percent of the County Federal-Aid roads in the County would be paved to provide an adequate transportation network for the rural population. Thus, the County would have to pave approximately 86 miles of the existing gravel road network as a supplement to the existing 17 miles of paved road.

The average total construction cost for County Federal-Aid and secondary highways is currently $43,000 per mile, and the average grading and graveling cost is $18,000.[77] The difference, $25,000 per mile, is approximately the State-wide cost of paving an existing gravel road. However, this estimate is low for Mercer County, given the terrain. A more realistic total cost would be approximately $55,000 per mile.[78] In addition, the County needs to spend approximately $500,000 to make County bridges adequate for the current traffic flow. The cost estimates for re-paving 17 miles of highway and upgrading bridges yield an expected capital outlay of $1.4 million on County roads, and for paving 86 miles of highway and upgrading bridges yield an expected capital outlay of $5.2 million.

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[73] Ramsey and McLean Counties' per capita cost was $2.

[74] Actually the total cost of educational administration might decrease, if additional school district consolidation occurs in the County. The remaining districts would be sufficiently large to handle all administrative matters which would eliminate the need for administrative assistance from the County.

[75] North Dakota, "North Dakota Highway Statistics," 1973. p. 9.

[76] In neither case did we have data to estimate where the rural area population would live within the County.

[77] North Dakota, "North Dakota Highway Statistics," 1973, p. 50.

Highway maintenance costs for all County roads in the State currently average $332 per mile. Mercer County road maintenance is not shown as a separate budgetary line item. However, the maintenance cost budget for Mountrail County, with comparable terrain and a budget separating county and local county road expenditures, shows that the cost is $160 per mile.[79] Thus, the current maintenance budget for Mercer County is estimated to be $79,000, which is the average of the two cost estimates (Table 6.6). Assuming that the County maintenance budget corresponds to that of Ramsey County, which has a network similar to that proposed for Mercer and a population level equal to the projected Mercer County population, means that the cost of proper maintenance would be $290 per mile. Thus, the new estimated maintenance budget would be $92,000 (Table 6.7)

The annual County road costs depend upon how many miles of highway construction the County will annually fund. If the County aims to complete the proposed paving by the mid-1980's (a five-year period), then it would have to fund between $287,000 and $1.1 million annually of County road construction. (If the County maintains the average Statewide county ratio of 2.2 to 1 between construction and maintenance expenditures, it would spend $200,000 on County road construction. At that rate it would complete the network needed for the UCA population in 7 years and for the RCA population in 25 years.) Thus the annual (construction and maintenance) costs could range from $379,000 to $1.2 million for the County road network.

Township Roads.[80] The other County-maintained road network is 550 miles of unorganized township roads.[81]

The township roads primarily serve the farm population. The new population, except for a very limited number of commuting workers and some recreational traffic, would not

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[78] North Dakota, State Highway Department, Personal Communication.

[79] An independent estimate provided by personal communication with the North Dakota State Highway Department was $165 per mile in Mercer County.

[80] Most counties in North Dakota maintain only County roads. Townships are responsible for maintaining organized township roads. Five counties, including Mercer, do not have organized townships. The County is responsible for township roads, and monies for them are included in the County budget.

[81] North Dakota, "North Dakota Highway Statistics," 1973, p. 9.

TABLE 6.6 Road Budget for Mercer County for FY 1972

Category	Receipts - FY 1972			Category	Expenditures			Surplus (Deficit)
	County	Township	Total		County	Township	Total	
Real Property	$ 41,000	$58,000	$ 99,000	Construction	$ Not Available	$ Not Available	$ 304,000	$
Personal Property Replacement	17,000	30,000	47,000	Operation and Maintenance[a]	79,000	14,000	93,000	
Highway Tax	121,000	--	121,000					
Federal Agencies	137,000	--	137,000					
Transfers	30,000	--	30,000					
TOTAL	$349,000	$88,000	$434,000		$ Not Available	$ Not Available	$ 397,000	$37,000

a. Approximate estimates rather than Mercer County budget data because the latter did not separate county and township expenditures.

TABLE 6.7 Road Budget for Mercer County for Mid 1980's

Category	Receipts - Mid 1980's			Category	Expenditures			Surplus (Deficit)
	County	Township	Total		County	Township	Total	
Real Property	$ 90,000	$62,000	$152,000	Construction	$287,000 - $1,100,000	$14,000 - $121,000	$301,000 - $1,221,000	$
Personal Property Replacement	24,000	31,000	55,000	Operation and Maintenance	92,000	14,000	106,000	
Highway Tax	258,000	--	258,000					
Federal Agencies	42,000	--	42,000					
Transfers	38,000	--	38,000					
TOTAL	$452,000	$93,000	$545,000		$379,000 - $1,192,000	$28,000 - $135,000	$407,000 - $1,327,000	$138,000 or ($781,000)

have much impact on township roads. At a minimum, the new population would have no impact on the township roads, and no new capital outlay could be attributed to the population. At a maximum, the new population would have such an impact on township roads that all township roads would need graveling because of their activity. The graveling cost for township roads is $1,100 per mile,[82] and the total capital outlay is estimated to be $605,000.

Maintenance costs for all township roads in the State currently average $58 per mile.[83] However, the maintenance cost budget for Mountrail County, which has comparable terrain and which has a budget separating County and township road expenditures, shows that the cost is $28 per mile.[84] Thus the current and future maintenance budget, based on the latter cost, is estimated to be $14,400.

The annual township road costs depend upon how many miles of road construction the County will fund annually. If there is no additional impact attributable to the new population and the County maintains the state wide ratio of 1 to 1 between township road construction and maintenance, then it would spend $14,400 annually on road construction. If there is total impact attributable to the new population, and the County gravels all roads over a five-year period, then it would spend $121,000 annually on road construction. Thus the annual (construction and maintenance) costs could range from $28,000 to $135,000.

Library. The FY 1972 combined library budget (Mercer and McLean Counties) was $31,000. Approximately $20,000 was spent on salaries, $6,000 on plant and equipment, and $5,000 on book acquisition. McLean County has two-thirds of the population and Mercer County one-third. At that ratio, Mercer County's expenditure is $10,000, of which $1,700 is for book acquisition.

The additional growth in population in Mercer County (as well as McLean) would necessitate an expansion of the collection. The number of volumes needed to serve Mercer County alone should increase from 12,400 to 26,600, or by 14,200 volumes. The physical space in the Riverdale library would continue to be adequate as the central distribution point for the system, but the physical space in Beulah and Hazen would be inadequate. The two libraries would need to add 3,500 square feet collectively to their units.

The costs of books are $10 per adult book and $6 per children's book.[85] Assuming that the current ratio of children's to adult books (2 to 1) continues, the total cost of new volumes for the increased population would be approximately $59,000.[86] The cost of increasing the physical space capacity in Beulah and Hazen is estimated to be $77,000 if new structures are built.

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[82] *Ibid.*, p. 50. While this cost appears low, the 1973 graveling cost in Morton County, which borders Mercer County to the south, was $1,200 to $1,500 per mile according to County Engineer, Morton County (August 1974).

[83] *Ibid.*

[84] *Ibid.*

[85] North Dakota, State Library Commission.

The cost of operating the library system in FY 1972 was $2 per capita. The per capita expenditure is estimated to increase to $3 because of the increase in library revenues resulting from a change in the County mill levy and availability of Federal grants. We have not estimated a potential increase in annualized capital cost resulting from the addition of physical space because of our uncertainty about how these facilities would expand and of the potential of covering this cost with other monies in the County budget—for example, revenue sharing. Thus, the change in County population from 6,200 to 13,300 would increase the Mercer County share of the library cost from $10,000 to $37,000. Assuming that one-third of that cost is expended on book acquisition, Mercer County would need only five years to build a collection which meets national standards.

Hospital. While a 7,100-population increase in Mercer County would seem to warrant an increase in the bed capacity of the Hazen Hospital, several factors suggest that the County residents ought to proceed slowly with any expansion plans. At this time, the Hazen Hospital has the capacity to handle 30 percent of the estimated increase in population. In addition, there are 24 potentially available beds for acute care in the hospital in Garrison, 55 miles from Hazen. This bed space could be used to meet a deficit of bed capacity in Mercer County for a short time. Lastly, the number of doctors in a community is a major determinant of hospital use. With only four doctors in the County, only 28 beds would be regularly occupied in the hospital.

The citizens of Langdon and Cavalier County responded to a similar boom and added ten beds to their hospital. While the ten-bed addition has been completed for only nine months, there has been no need for this additional capacity.

If there is a demand for expansion, the Hazen Hospital would need an additional 23 beds according to state standards. Hospital construction costs currently average $50,000 per bed.[87] Thus, the total capital requirement for hospital expansion would be $1,150,000.

A more important area in which the hospital could immediately expand services is in its capacity to treat major industrial accidents. In other developing areas, particularly in Canada, hospitals in rural areas have not been prepared to handle these accidents and patients have died. Hazen Hospital is fortunate in that it can draw upon the services of the State Department of Health to develop the necessary capacity.

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[86] North Dakota, State Library Commission. The North Dakota standard, as well as the National standard, calls for two adult books for every one children's book. However, we have assumed that the combined library will continue to pursue its present acquisition policy.

[87] North Dakota State Department of Health, Division of Health Facilities.

Revenues

Real Property Tax. The County received $113,000 in real property tax receipts for both general and special purpose (excluding the library) activities in FY 1972. The taxable value was $5.8 million, and the mill levy was 19.25.[88] The County taxable value is estimated to increase as a result of new residential housing units to $12.9 million (Table 5.14). Assuming the same mill levy, the annual revenues to the County would be $248,000.

Personal Property Replacement. The County received $72,700 in personal property replacement, as a receipt for both general and special purpose activities. The personal property replacement is based on one-seventh of the change in real property tax over the 1968 base of $144,900 plus $79,400. Real property tax is calculated for the purpose of determining personal property replacement on the basis of a taxable value of $5.1 million, rather than a total taxable value of $5.8 million. In this case, real property tax in 1972 was $98,200. The receipt base of $79,400, minus one-seventh of the difference, resulted in a personal property replacement of $72,700.[89] The County taxable value subject to personal property replacement is estimated to increase as a result of new residential housing units to $12.2. Real property tax, assuming a 19.25-mill levy, would be $234,800. One-seventh of the difference between the estimated real property tax and the base real property tax plus $79,400 would result in a personal property replacement of $92,200.

Co-op Replacement. The County received $66,000 in energy receipts in FY 1973. These receipts were derived from a two percent tax on gross receipts of the two rural electric generating cooperatives in the County, Basin Electric and UPA. Of all receipts received by Mercer County, 40 percent were allocated to the County general fund. Since the new lignite development, which would include the nearly completed expansion of the Basin

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[88] The total County mill levy of 27.75 is divided as follows: 19.25 for general and special purpose, 1.50 for the library, and 7.0 for County roads.

[89] The personal property replacement is divided among the following sources:

Source	Mills	Tax Base 1968	Receipt Base 1968	1972 Taxes	Personal Property Replacement
General	19.25	$ 84,400	$ 46,000	$ 98,200	$ 72,700
Library	1.50	6,300	3,500	7,600	3,700
County Roads	7.00	29,800	16,000	35,700	16,800
County Equalization	21.00	89,500	49,500	107,100	92,000
TOTAL	48.75	$210,000	$115,000	$248,600	$185,200

Electric plant, is not included in the revenue calculation for the County, the co-op replacement would be approximately the same as the present amount.

Revenue Sharing. The County received approximately $100,000, or $16 per capita, in Federal revenue sharing beginning in FY 1973. We have assumed that the County would continue to receive this per capita amount in the mid-1980's. Thus, it would receive $213,000 annually in revenue sharing funds.

Federal Funds. We have assumed that assistance from the Law Enforcement Assistance Administration would be discontinued by the mid-1980's because its grants for deputy sheriff salaries are limited to four-year periods.

Miscellaneous. Mercer County received $16,700 in mixed sources of revenue in FY 1972. These sources consisted primarily of estate tax and receipts from County offices. Assuming that this source would remain at $3 per capita, the annual receipts would be $38,000.

Roads. County road system revenues for the most part are derived from property tax levies, highway taxes, personal property replacement, and Federal aid. The property tax receipts are derived from a seven-mill levy on the County taxable value of $5.8 million; they were $41,000 in FY 1972 (Table 6.6). The same mill levy and an increase in taxable value to $12.9 million would increase the real property tax yield to $90,000 (Table 6.7). Personal property replacement would be one-seventh of the difference between $85,400 and $29,800, plus $16,000, or $23,900. The highway tax revenue is essentially a function of the number of vehicles registered in Mercer County in the mid-1980's compared to the number of vehicles registered then in the entire State. This revenue is estimated to increase from $121,500 to $258,000 by the 1980's.[90] The Federal-Aid for Mercer County is a function of the ratio of the County's total area, population, and postal route mileage to the State's total area, population, and postal route mileage. It averaged $121,000 for FY 1971 and FY 1972. According to the distribution formula, Mercer County should have received only $36,000 in FY 1971 and FY 1972 and would receive approximately $42,000 with the projected increase in population. However, it has been receiving special impact considerations for flood damages. Since no other information is available, the size of the special impact funds in the Mid-1980's is assumed to equal normal payment of $42,000. Transfers from other funds are assumed to approximate the FY 1971 and FY 1972 average of $38,000. The contribution of all the tax sources would result in annual revenues of $452,000.

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[90] The basis of estimating the annual receipts of motor vehicle registration fees and motor fuel taxes received by Mercer County and its cities during the mid-1980's was provided by the Planning and Research Division of the North Dakota State Highway Department. For details see Appendix F.

Township road system revenues are derived from property tax levies and personal property replacement. The property tax revenue is derived from a 14-mill levy on a taxable value of $4.1 million in unorganized townships in the County. This resulted in $58,000 in real property tax receipts in FY 1972. Assuming that the taxable value in unorganized townships would increase by $350,000, or to a total of $4.4 million as a result of residential housing, the real property tax yield would be $62,300. Personal property replacement would be one-seventh of the difference between $57,700 and $45,600, plus $29,200, or $30,900.[91] The contribution of both tax sources would result in annual revenues of $93,200.

Library. The Mercer County share of the library system costs is covered by real property tax and personal property replacement. The available revenues will increase in future years because the mill levy is changing from 1.5 to 2 mills. A 2 mill levy and an increase in taxable value to $12.9 million would generate an annual revenue of $26,000. Personal property replacement would be one-seventh of the difference between $24,400 and $12,600, plus $6,900, or $8,600. The total available receipts would be $35,000.

Hospital. The present hospital facility, completed in 1970, was built without taxing County residents. Of the total cost of $1.2 million, $552,000 was covered by a Federal grant under the Hill-Burton Act, and $648,000 was covered by an industrial revenue bond issued by the City of Hazen. We have assumed that the capital requirement will be met in a similar manner for the new addition, which means no increase in County taxes.[92]

The hospital currently covers operation and maintenance costs. It is assumed that this situation will prevail in the future.

Revenues Versus Costs

General Services. Contrasting the total receipts with the total expenditures for the mid-1980's indicates a surplus of $120,000 for general services. The FY 1972 budget surplus was only $25,000. The estimated surplus might actually be greater because the mid-1980's budget receipts do not take into account property tax receipts resulting from new commercial activity, estimated to be $9,000,[93] and property tax receipts and in lieu payments resulting from lignite development, estimated to be $1.2 million (Table 6.27). On the other hand, the County would operate at a deficit of approximately $100,000 without Federal revenue sharing funds. In light of a substantial increase in taxable value as a result of lignite development activities, we would anticipate a budget surplus.

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[91] The personal property replacement in the FY 1972 budget was based on a taxable value of $3,775 000. The FY 1972 tax was $52,500. One-seventh of the difference between $52,600 and the tax base of $45,500, plus $29,200, resulted in a total personal property replacement of $30,200.

[92] We recognize that the capital grant provision of the Hill-Burton program for building new hospital beds may be changed by Congress. Since it has not been eliminated at this time, we have assumed that it would operate in the future.

[93] The new taxable value is 10 percent of the new commercial value (Table 5.18), and a 19.75-mill levy.

Roads. The current system for financing County road construction would be adequate if the new population concentrates in the population centers and thus makes only minimal demands on the County road network. The annual costs ($379,000) would be less than the annual revenues ($452,000) by $73,000. However, the system for financing would be inadequate if the population does not concentrate in the population centers and thus makes major demands on the County road network. The annual costs ($1,192,000) would exceed the annual revenues ($452,000) by $740,000.

The current system for financing township roads would be adequate, if the new population places minimal demands on roads which essentially serve the farm population. The annual costs ($28,000) would be less than the annual revenues ($93,000) by $65,000. The system for financing would be inadequate if the new population heavily utilizes township roads. The annual costs ($135,000) would exceed the annual revenues ($93,000) by $42,000.

Library. The combination of a higher mill levy and increased taxable value would more than triple the Mercer County contribution to the library system. However, the library would operate at a small deficit of $2,000, which could be covered by Federal grants or County revenue sharing funds. Thus we do not anticipate a problem in this area.

Hospital. We anticipate that the hospital will continue to cover its costs.

Total Budget. We have estimated that County government could have either a surplus or a shortage of funds in the mid-1980's to meet the demands of the permanent residents. The shortage would occur if the County needs to upgrade its roads to serve a widely dispersed rural population. Actually, County government would have surplus funds available for general activities, and encounter only a small shortage for operation of the library system. However, it would have a surplus only as long as the Federal Government continues the revenue sharing program.

The estimated shortage of funds must be seen in the light that our revenue estimate in 1972-73 dollars is a significant underestimate of available funds. The receipts do not take into account the taxable value of commercial outlets or lignite development. The latter revenues are ignored in this section because of the uncertainty about how the State will capture part of the taxable value and how other counties and cities might share in the taxable value.

City Costs and Revenues

The analysis of city costs and revenues is very difficult because of the lack of data. Budgets were examined for all cities in Mercer County plus budgets for cities comparable to the projected size of Mercer County cities. The review did not provide the basis for building composite budgets for representative size cities because there is no uniform format for recording city receipts and expenditures in North Dakota. Consequently, the data for analyzing the impact on the public facilities in each major city are a composite of data unique to the city and general sources. In spite of these limitations, the projected mid-1980's budgets should be reasonably representative of the type of expenditures and receipts in 1973 dollars of those cities as they expand to accommodate the new population.

Changes in city revenues and expenditures resulting from lignite development may be difficult to distinguish from other activities. For example, the Federal Law Enforcement Assistance Administration is just beginning to supplement the law enforcement effort in Mercer County. One city changed its police budget from $25 per month to $650 per month. The large increase is a result of Federal funds. However, the city may continue part or all of the expenditure when Federal support is withdrawn. Should the additional policeman hired in response to lignite development be costed out at the salary he would have been paid in the absence of Federal support or at the level of his Federally supported salary?

The analysis of the three cities of Beulah, Hazen, and Stanton examines the costs and revenues of expanding city services to accommodate the new residents. The format of the analysis is to (a) establish the capital (debt service) operation and maintenance (O&M) costs of a new level of service for the new population in the mid-1980's, (b) establish the revenues generated by the new population in the mid-1980's, and (c) measure the net fiscal impact. The analysis presents estimates based on both urban and rural concentration assumptions.

Beulah

The previous chapter described the physical plant supporting Beulah public services and excess capacity, if any, to accommodate new population.

The FY 1973 Beulah city and special district budgets indicate that the city offered a wide range of services and received funds from several sources (Table 6.8). The City services have been grouped into general and utility services in order to distinguish between activities primarily dependent upon taxes and transfer payments and those primarily dependent upon user charges. The park and airport districts are presented as independent units because their receipts are derived from special mill levies. (The airport district is not discussed in the following analysis because we did not know how to assess the demand made on the airport as a result of lignite development.)

TABLE 6.8 Beulah City and Special District Budgets for FY 1973

Receipts		Expenditures	Debt Service[b]	O & M	Total	Surplus (Deficit)
GENERAL SERVICES						
Real Property Tax[a]	$ 41,100	General Government	$ 3,600	$ 16,300	$ 19,900	$
Personal Property[a]		Police	--	12,400	12,400	
Replacement	8,300	Fire	--	1,300	1,300	
Co-op Replacement	8,900	Streets and Alleys	--	21,700	21,700	
Other Property Tax	2,200	Street Lighting	--	7,100	7,100	
Beer and Liquor		Swimming Pool				
Tax	5,500	Contribution[c]	--	9,000	9,000	
Cigarette Tax	6,600	Convention Center	3,900	13,700	17,600	
Highway Fund	17,400	Miscellaneous	--	3,300	3,300	
Revenue Sharing	8,700					
Federal Assistance	3,700					
Miscellaneous	10,300					
SUBTOTAL	$ 112,700		$ 7,500	$ 84,800	$ 92,300	$ 20,400
UTILITY SERVICES						
Water User Charges	$ 30,500	Water User Charges	$ 6,800	$ 20,900	$ 27,700	$
Water Assessment	5,200	Water Assessment	5,200	--	5,200	
Sewer	8,300	Sewer	2,900	5,500	8,400	
Solid Waste Disposal	17,200	Solid Waste Disposal	--	16,300	16,300	
SUBTOTAL	$ 61,200		$ 14,900	$ 42,700	$ 57,600	$ 3,600
TOTAL	$ 173,900		$ 22,400	$ 127,500	$ 149,900	$ 24,000
PARK DISTRICT						
Real Property	$ 7,900	Maintenance	$ --	$ 9,300	$ 9,300	$
Personal Property		Swimming Pool				
Replacement	2,400	Contribution	--	1,000	1,000	
Other	300					
TOTAL	$ 10,600		$ --	$ 10,300	$ 10,300	$ 300

a Includes receipts raised for general services, bond sinking and interest fund, social security, cemetery and advertising. It does not include special assessment.

b Special assessment debt for streets is not included in our analysis because it is not part of city-wide debt. Special assessments on new residential property (streets, curbs and water and sewer lines) are included in the cost of residential lots.

c The swimming pool is managed by an independent recreation association. Its total receipts are $13,000 (including $3,000 from the city and $1,000 from the park district) and its total expenditures are $10,000. The extra $3,000 is being used for debt retirement. The budget of the recreation association is not included in our analysis because it is not a public body.

The format of the following analysis is to present first the costs of all service and then the revenues available to support those services. The differential effect of the urban concentration assumption (UCA) and the rural concentration assumption (RCA) are detailed under each service entry. The cost and revenue data are presented in separate budgets for each assumption. Then there is a brief discussion of the projected impact.

Costs

General Government Services. The city hall could accommodate the increased activity resulting from the new population. The current cost (just O&M) of general government services is $12 per capita (1,344 population). We do not anticipate that the cost would fall much lower because the current cost is the cost incurred in larger cities.[94] Consequently, the annual costs (just O&M) would be $58,100 under UCA (4,838 persons) and $47,400 under RCA (3,951 persons) (Tables 6.9 and 6.10).

Police Protection. The city currently has adequate capacity to serve the existing population. According to the police protection standards, the City would need an additional five policemen under UCA and an additional four policemen under RCA. With a total police force of seven or six, the city would be able to provide 24-hour police protection. The FY 1973 budget entry for police services reflects only the cost of one policeman because the other policeman (deputy sheriff) is supported by Federal funds given to the County. Additional police protection (salary and car expenses) costs $12,000 per policeman at a minimum, and would result in the upgrading of the pay for all policeman. The annual costs (just O&M) would be $84,000 under UCA and $72,000 under RCA. Police protection costs of approximately $18 per capita would be higher than the cost in cities with populations corresponding to Beulah's projected population.[95]

Fire Protection. The City's physical plant is adequate to serve a population of 9,600. Thus it could accommodate the population increase under both UCA and RCA. The cost of fire protection is currently $1 per capita and approaches $2 per capita in larger cities in North Dakota.[96] Assuming a $2 per capita cost, the annual costs (just O&M) would be $9,700 under UCA and $7,900 under RCA.

Streets and Alleys. The cost of maintaining streets and alleys is $16 per capita. The per capita cost appears to increase as city size increases, if Bottineau with a $23 per capita cost and Grafton with a $22 per capita cost are representative. Assuming that a $22

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[94] The per capita cost in Bottineau (2,760) is $12.

[95] In FY 1972 the per capita cost in Grafton was $13 and in Bottineau $12.

[96] In Grafton and Bottineau, it was $2 per capita.

TABLE 6.9 Beulah City and Special District Budgets for Mid 1980's, Urban Concentration Assumption

Receipts		Expenditures	Debt Service	O & M	Total	Surplus (Deficit)
GENERAL SERVICES						
Real Property Tax	$ 183,300	General Government	$ 3,600	$ 58,100	$ 61,700	$
Personal Property		Police	--	84,000	84,000	
Replacement	28,700	Fire	--	9,700	9,700	
Co-op Replacement	10,600	Streets and Alleys	--	106,400	106,400	
Other Property Tax	7,900	Street Lighting	--	24,200	24,200	
Beer and Liquor		Swimming Pool				
Tax	19,400	Contribution	--	9,700	9,700	
Cigarette Tax	24,200	Convention Center	3,900	13,700	17,600	
Highway Fund	44,900 a	Miscellaneous	--	9,700	9,700	
Revenue Sharing	48,400					
Federal Assistance	--					
Miscellaneous	24,200					
SUBTOTAL	$ 391,600		$ 7,500	$ 315,500	$ 323,000	$ 68,000
UTILITY SERVICES						
Water User Charges	$ 89,000	Water User Charges	$ 6,800	$ 72,600	$ 79,400	$
Water Assessment	17,600	Water Assessment	17,600	--	17,600	
Sewer	29,000	Sewer	7,400	19,400	26,800	
Solid Waste Disposal	62,900	Solid Waste Disposal	--	58,000	58,000	
SUBTOTAL	$ 198,500		$ 31,800	$ 150,000	$ 181,800	$ 16,700
TOTAL	$ 590,100		$ 39,900	$ 465,500	$ 504,800	$ 85,300
PARK DISTRICT						
Real Property	$ 35,000	Maintenance	$ --	$ 38,700	$ 38,700	$
Personal Property						
Replacement	6,300					
Other	600					
TOTAL	$ 41,900		$ --	$ 38,700	$ 38,700	$ 3,200

a. These total to $169,000. The per capita revenue is $35.

TABLE 6.10 Beulah City and Special District Budgets for Mid 1980's, Rural Concentration Assumption

Receipts		Expenditures	Debt Service	O & M	Total	Surplus (Deficit)
GENERAL SERVICES						
Real Property Tax	$ 150,400	General Government	$ 3,600	$ 47,400	$ 51,000	$
Personal Property Replacement	23,400	Police	--	72,000	72,000	
Co-op Replacement	10,400	Fire	--	7,900	7,900	
Other Property Tax	6,500	Streets and Alleys	--	86,000	86,000	
Beer and Liquor Tax	15,800	Street Lighting	--	19,800	19,800	
Cigarette Tax	19,800 [a]	Swimming Pool Contribution	--	7,900	7,900	
Highway Fund	43,400	Convention Center	3,900	13,700	17,600	
Revenue Sharing	39,500	Miscellaneous	--	7,900	7,900	
Federal Assistance	--					
Miscellaneous	19,800					
SUBTOTAL	$ 329,000		$ 7,500	$ 262,600	$ 270,100	$ 58,900
UTILITY SERVICES						
Water User Charges	$ 74,000	Water User Charges	$ 6,800	$ 59,300	$ 66,100	$
Water Assessment	14,900	Water Assessment	14,900	--	14,900	
Sewer	23,700	Sewer	6,200	15,800	22,000	
Solid Waste Disposal	51,400	Solid Waste Disposal	--	47,400	47,400	
SUBTOTAL	$ 164,000		$ 27,900	$ 122,500	$ 150,400	$ 13,500
TOTAL	$ 493,000		$ 35,400	$ 385,100	$ 420,500	$ 72,500
PARK DISTRICT						
Real Property	$ 28,800	Maintenance	$ --	$ 31,600	$ 31,600	$
Personal Property Replacement	5,900					
Other	600					
TOTAL	$ 35,300		$ --	$ 31,600	$ 31,600	$ 3,700

a. These total $144,800. The per capita revenue is $37.

per capita cost is representative for Beulah, the annual costs (just O&M) would be $106,400 under the UCA and $86,000 under RCA. In addition, the City would have to install traffic controls, such as stop signs, turning lanes and parking restrictions, to accommodate its new residential population. However, we do not anticipate that the City would have to upgrade significantly its major thoroughfares because the State highways north and west of town are the major thoroughfares.

Swimming Pool. The swimming pool entry in the City budget is only a contribution by the City to the Recreation Association (see Footnote to FY 1973 Budget). Normally the contribution would be approximately $3,000. It was much higher in FY 1973 because the City used part of its revenue sharing funds for that purpose. Assuming a continuation of a contribution of $2 per capita, the annual costs would be $9,700 under UCA and $7,900 under RCA.

Convention Facility. The annual costs for maintaining the facility would remain at approximately the same level even if the population would double. Thus the annual costs (just O&M) would be $13,700 under both UCA and RCA.

Miscellaneous. This category includes such services as building inspection, dog and bike licenses, and cemetery maintenance. The annual costs are assumed to increase as the total population increases. Assuming that the per capita cost remains at approximately $2, the annual costs would be $9,700 under UCA and $7,900 under RCA.

Water. Since the existing physical plant has excess capacity for only 1,000 new residents, it would have to be expanded to serve an additional 2,500 people under UCA and 1,600 people under RCA. Pumping capacity and treatment for 500,000 gallons would accommodate the UCA residents, and pumping capacity and treatment for 300,000 gallons would accommodate the RCA residents. Expansion of the pump house and treatment plant would cost approximately $135,000 for the UCA population and $116,000 for the RCA population.[97] (The cost of the additional distribution system is reflected in the costs of residential lots.) The annual debt service would be $12,400 under UCA and $9,700 under RCA.[98] It is entered in the budget as an additional assessment. Assuming that water O&M costs remain at $15 per capita, the annual O&M costs would be $72,600 under UCA and $59,300 under RCA.

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[97] This preliminary engineering estimate was provided by Consulting Engineers Diversified, Bismarck.

[98] The annual debt service is based on a 20-year bond at 6¼ percent. The capital cost to the City would be lower if it received a grant/loan from the Farmers Home Administration. However, such funds are very limited at this time.

Sewer. Since the sewer lagoon system has excess capacity for a population of only 176, it would have to be expanded to serve an additional 3,400 people under UCA and 2,500 people under RCA. A 34-acre expansion would accommodate UCA residents, while a 25-acre expansion would accommodate RCA residents. At a cost of $1,500 per acre, the City investment would be $51,000 to serve the UCA population and $37,500 to serve the RCA population.[99] The annual debt service costs (principal and interest) would be $4,500 under UCA and $3,300 under RCA. Assuming that O&M costs remain at $4 per capita, the annual O&M costs would be $19,400 under UCA and $15,800 under RCA.

Solid Wate Disposal. Solid waste disposal would probably be handled by a private contractor, given resolution of the current unsettled situation. The previous contractor charged the City approximately $12 per capita annually to collect and dispose of solid waste. The annual costs to the City would be $58,000 under UCA and $47,400 under RCA.

Parks & Recreation. According to the recreation standards, the City has adequate facilities for the population increase. It has tennis courts, basketball courts, a baseball field, and a swimming pool. We anticipate that the developers of subdivisions will be required to build neighborhood facilities as part of their complexes. We also think that the residents of Beulah might wish to invest in winter recreation facilities, but we have not attempted to determine the types of facilities. Thus, the only cost increase anticipated at this time is O&M costs. Assuming that these costs remain at $8 per capita, the annual O&M costs would be $38,700 under UCA and $31,600 under RCA.

Revenues

Real Property Tax. The City received $41,100 in real property tax as a receipt for both the general and special purpose activities in FY 1973. The taxable value was $876,100 and the mill levy was 46.9. The city taxable value is estimated to increase as a result of new residential housing units to $3.9 million under UCA and to $3.2 million under RCA (Table 5.14). Assuming the same mill levy, the annual revenue to the City would be $183,300 under UCA and $150,400 under RCA.

Personal Property Replacement. The City received $8,300 in personal property replacement as a receipt for both general and special purpose activities. The personal property replacement is based on one-seventh of the change in real property taxes over $25,900, plus $7,600. Real property taxes are calculated by the State for the purpose of determining personal property replacement on the basis of a residential taxable value of

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[99] The State Department of Health estimates the cost of lagoon expansion at $6,000/acre. The above cost estimate reflects a 75 percent grant under the 1972 Federal Water Pollution Control Act.

Revenue Sharing. The City receives an average $10 per capita from the Federal Government. The annual revenue would be $48,400 under UCA and $38,500 under RCA.

Federal Assistance. Since Federal assistance is not received on a regular basis, it is not considered part of the City's revenue base.

Miscellaneous. Beulah received $10,300 in mixed sources of revenue in FY 1973. These sources consisted of such items as penalty and interest, unemployment aid, dog and bicycle licenses, and insurance claims. The amount of revenue is extremely high because of $3,700 of unemployment aid; deleting that item would suggest an average annual per capita revenue of $5. The annual revenue would be $24,200 under UCA and $19,800 under RCA.

Utility Services. City utility services (water, sewage, and solid waste) generate their own revenues. The water revenue is more complicated than in most cities because part of the debt service is funded by a special assessment and part by user charges. The water revenue from user charges is $30,500, of which $23,700 ($17 per capita) is available for O&M and $6,800 is available for debt retirement. While all $6,800 is used for debt retirement, only $20,900 ($15 per capita) of the $23,700 is used for O&M. The other water revenue is a special assessment of $5,200, which is used for debt service. Assuming that annual revenue for O&M will continue at $17 per capita, the annual revenue in that category would be $82,200 under UCA and $67,200 under RCA. In addition, there would be the other user charge revenue for debt retirement of $6,800, the present special assessment of $5,200, and a new special assessment of $12,400 under UCA and $9,700 under RCA. The total revenues would be $89,000 in user charges and $17,600 in special assessments under UCA, and $74,000 in user charges and $14,900 in special assessments under RCA. The sewer revenue is $6 per capita, which means that the annual revenue would be $29,000 under UCA and $51,400 under RCA.

Parks. Revenues for the park system are derived from a nine-mill levy on the City taxable value and personal property replacement. The City taxable value is estimated to increase as a result of new residential housing units to $3.9 million under UCA and to $3.2 million under RCA. The annual revenue to the district would be $35,000 under UCA and $28,800 under RCA. The personal property replacement is based on one-seventh of the change in real property tax over $4,700, plus $2.200. It is calculated on the same taxable base as the City personal property replacement. The annual revenue would be $6,300 under UCA and $5,900 under RCA. The other revenue is estimated to double; it would be $600 under both assumptions. Total park district receipts under UCA would be $41,900 and under RCA would be $35,300.

Impact on City Finances

The City had an adequate financial base in FY 1973 to support city services. It operated with surpluses in general and utility services and in the park district.

We have estimated that the City would have an adequate financial base to provide the services required by new residents. It would operate under two different population projections (high and low estimates) with significant surpluses in the general and utility services and park district accounts.

We were surprised that the City would have an adequate financial base essentially on the increase in per capita State transfers, in per capita tax receipts, and in the additional taxable value generated by residential activity. The increased taxable value of industrial and commercial activities apparently would not be needed to sustain the new level of city services. However, if the City upgrades the level of services and per capita costs increase greater than we estimate, then the City would need the revenue.

The importance of revenue sharing and other Federal financial assistance should not be overlooked. Particularly under RCA, the amount of revenue sharing, $39,500, is 70 percent of the surplus, $58,900. The surplus in utility services would essentially disappear if the City paid the full cost of its sewer system rather than only 25 percent.

Hazen

The previous chapter described the physical plant supporting Hazen's public services and excess capacity, if any, to accommodate new population.

The FY 1973 Hazen city and special district budgets indicate that the City offered a wide range of services and received funds from several sources (Table 6.11). The city services have been grouped into general and utility services in order to distinguish between activities primarily dependent upon taxes and transfer payments and those primarily dependent upon user charges. The park district is presented as an independent unit because its receipts are derived from a special mill levy.

The format of the following analysis is to present first the costs of all services and then the revenues available to support those services. The differential effect of UCA and RCA are detailed under each city service entry. The cost and revenue data are presented in separate budgets for each assumption. Then there is a brief discussion of the projected impact.

TABLE 6.11 Hazen City and Special District Budgets for FY 1973

Receipts		Expenditures				Surplus (Deficit)
GENERAL SERVICES			Debt Service[b]	O & M	Total	
Real Property Tax[a]	$ 30,800	General Government	$ 3,800	$ 20,000	$ 23,800	$
Personal Property Replacement[a]	6,800	Police	--	8,900	8,900	
Co-op Replacement	8,200	Fire	--	800	800	
Other Property Tax	3,000	Streets and Alleys	--	21,200	21,200	
Beer and Liquor Tax	4,700	Street Lighting	--	7,900	7,900	
Cigarette Tax	6,100	Swimming Pool Contribution[c]	--	1,000	1,000	
Highway Fund	16,000	Convention Center	--	--	--	
Revenue Sharing	10,000	Miscellaneous	--	300	300	
Federal Assistance	--					
Miscellaneous	4,400					
SUBTOTAL	$ 90,000		$ 3,800	$ 60,100	$ 63,900	$ 26,100
UTILITY SERVICES						
Water User Charges	$ 24,500	Water User Charges	$	$ 7,400	$ 7,400	$
Water Assessment[a]	10,600	Water Assessment[a]	24,600	--	24,600	
Sewer	4,900	Sewer		5,000	5,000	
Solid Waste Disposal	15,600	Solid Waste Disposal		15,200	15,200	
SUBTOTAL	$ 55,600		$ 24,600	$ 27,600	$ 52,200	$ 3,400
TOTAL	$ 145,600		$ 28,400	$ 86,700	$ 116,100	$ 29,500
PARK DISTRICT						
Real Property	$ 5,100	Maintenance (Swimming Pool Contribution)	$ --	$ 10,800	$ 10,800	$
Personal Property Replacement	1,300					
Other	1,000					
TOTAL	$ 7,400		$ --	$ 10,800	$ 10,800	$ (3,400)

[a] Includes receipts raised for general services, bond sinking and interest fund, social security and cemetery. This does not include special assessments.

[b] Special assessment debt for streets is not included in our analysis because it is not part of citywide debt. Special assessments on new residential property (streets, curbs and water and sewer lines) are not included in the cost of residential lots.

[c] The swimming pool is managed by an independent recreation association.

Costs

General Government Services. The city hall could accommodate the increased activity resulting from the new population. The current cost (just O&M) of general government is $16 per capita (1,240 population). We anticipate that it would fall to $12 per capita (and maybe lower), given economies of scale as population increases.[100] Consequently the annual costs (just O&M) would be $51,300 under UCA (4,279 persons) and $41,300 under RCA (3,444 persons) (Tables 6.12 and 6.13).

Police Protection. The City currently has adequate capacity to serve the existing population. According to the police protection standards, the City would need an additional four policemen under UCA and an additional three under RCA. With a total police force of six or five, the City would be able to provide 24-hour police protection. The current cost of police services reflects only the cost of one policeman because the other policeman (deputy sheriff) is supported by Federal funds given to the County. Additional police protection (salary and car expenses) costs, at a minimum, $12,000 per policeman and would probably result in upgrading the pay for all policemen. The annual costs (just O&M) would be $72,000 under UCA and $60,000 under RCA.[101]

Fire Protection. The City has a physical plant adequate to serve a population of 9,600. Thus it could accommodate the population increase under both UCA and RCA. The costs of fire protection are currently $1 per capita and approach $2 per capita in larger cities.[102] Assuming a $2 per capita cost, the annual costs (just O&M) would be $8,600 under UCA and $6,900 under RCA.

Streets and Alleys. The current annual costs of maintaining streets and alleys are $17 per capita. The per capita cost appears to increase as City size increases if Bottineau with $23 per capita cost and Grafton with $22 per capita cost are representative. Assuming that a $22 per capita cost is representative for Hazen, the annual costs (just O&M) would be $94,100 under UCA and $75,800 under RCA. In addition, the City would have to install traffic controls, such as stop signs, turning lanes, and parking restrictions, to accommodate its new residential population. However, we do not anticipate that the City would have to upgrade significantly its major thoroughfares if the State builds the major by-pass on the northern edge of the City.

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[100] The per capita cost in Bottineau (2,760) is $12.

[101] These annual costs would increase the per capita cost to $17, higher than the cost in cities with populations corresponding to Hazen's projected population. In FY 1972, the per capita cost in Bottineau was $12, and in Grafton it was $13.

[102] In both Bottineau and Grafton, it was $2 per capita.

TABLE 6.12 Hazen City and Special District Budgets for Mid 1980's, Urban Concentration Assumption

Receipts			Expenditures	Debt Service	O & M	Total	Surplus (Deficit)
GENERAL SERVICES							
Real Property Tax	$ 177,800		General Government	$ 3,800	$ 51,300	$ 55,100	$
Personal Property Replacement	26,800		Police	--	72,000	72,000	
Co-op Replacement	9,400		Fire	--	8,600	8,600	
Other Property Tax	10,300		Streets and Alleys	--	94,100	94,100	
Beer and Liquor Tax	17,100		Street Lighting	--	25,700	25,700	
Cigarette Tax	21,400		Swimming Pool Contribution	--	4,300	4,300	
Highway Fund	39,000	a	Convention Center	--	--	--	
Revenue Sharing	42,800		Miscellaneous	--	4,300	4,300	
Federal Assistance	--						
Miscellaneous	17,100						
SUBTOTAL	$ 361,700			$ 3,800	$ 260,300	$ 264,100	$ 97,600
UTILITY SERVICES							
Water User Charges	$ 85,600		Water User Charges	$ --	$ 42,800	$ 42,800	$
Water Assessment [b]	10,600		Water Assessment [b]	24,600	--	24,600	
Sewer	17,100		Sewer	3,500	17,100	20,600	
Solid Waste Disposal	51,400		Solid Waste Disposal		51,300	51,300	
SUBTOTAL	$ 164,700			$ 28,100	$ 111,200	$ 139,300	$ 25,400
TOTAL	$ 526,400			$ 31,900	$ 371,500	$ 403,400	$ 123,000
PARK DISTRICT							
Real Property	$ 28,800		Maintenance	$ --	$ 38,500	$ 38,500	$
Personal Property Replacement	5,000						
Other	4,000						
TOTAL	$ 37,800			$ --	$ 38,500	$ 38,500	$ (800)

a. These total $147,700. The per capita revenue is $34.

b. This heading includes both water and sewer special assessment.

TABLE 6.13 Hazen City and Special District Budgets for Mid 1980's, Rural Concentration Assumption

Receipts		Expenditures	Debt Service	O & M	Total	Surplus (Deficit)
GENERAL SERVICES						
Real Property Tax	$ 137,100	General Government	$ 3,800	$ 41,300	$ 45,100	$
Personal Property Replacement	20,900	Police	--	60,000	60,000	
		Fire	--	6,900	6,900	
Co-op Replacement	8,900	Streets and Alleys	--	75,800	75,800	
Other Property Tax	8,300	Street Lighting	--	20,400	20,400	
Beer and Liquor Tax	13,800	Swimming Pool Contribution	--	3,400	3,400	
Cigarette Tax	17,200	Convention Center	--	--	--	
Highway Fund	37,000 [a]	Miscellaneous	--	3,400	3,400	
Revenue Sharing	34,400					
Federal Assistance	--					
Miscellaneous	13,800					
SUBTOTAL	$ 291,400		$ 3,800	$ 211,200	$ 215,000	$ 76,400
UTILITY SERVICES						
Water User Charges	$ 68,900	Water User Charges	$	$ 34,400	$ 34,400	$
Water Assessment	10,600	Water Assessment[b]	24,600	--	24,600	
Sewer	13,800	Sewer	2,400	13,800	16,200	
Solid Waste Disposal	41,300	Solid Waste Disposal	--	41,300	41,300	
SUBTOTAL	$ 134,600		$ 27,000	$ 89,500	$ 116,500	$ 18,100
TOTAL	$ 426,000		$ 30,800	$ 302,700	$ 331,500	$ 94,500
PARK DISTRICT						
Real Property	$ 22,500	Maintenance	$ --	$ 31,000	$ 31,000	$
Personal Property Replacement	4,300					
Other	3,000					
TOTAL	$ 29,800		$ --	$ 31,800	$ 31,800	$ (1,000)

a. These receipts total to $124,500. The per capita revenue is $37.
b. This heading includes both water and sewer special assessment.

Street Lighting. The cost of street lighting is assumed to continue at $6 per capita. The annual costs (just O&M) would be $25,700 under UCA and $20,400 under RCA.

Swimming Pool. The City contributes approximately $1 per capita towards the operation of the swimming pool. Assuming the same per capita contribution in the future, the annual costs would be $4,300 under UCA and $3,400 under RCA.

Miscellaneous. This category includes at this time only the board of health and cemetery maintenance. (It apparently will be expanded in the immediate future to cover such activities as building inspection and dog and bike licenses.) The annual costs are assumed to increase as the total population increases. Assuming that the per capita cost increases to $1, the annual costs would be $4,300 under UCA and $3,400 under RCA.

Water. Since the existing plant has excess capacity for 4,000 residents, it would not have to be expanded to accommodate the new population. Assuming that O&M costs remain at approximately $10 per capita, the annual O&M costs would be $42,800 under UCA and $34,400 under RCA.

Sewer. Since the sewer lagoon system has excess capacity for a population of only 460, it would have to be expanded to serve an additional 2,600 people under UCA and 1,700 people under RCA. A 26-acre expansion would accommodate the UCA residents and a 17-acre expansion would accommodate the RCA residents. At a cost of $1,500 per acre, the City investment would be $39,000 to serve the UCA residents and $27,000 to serve the RCA residents.[103] The annual debt service costs (principal and interest) would be $3,500 under UCA and $2,400 under RCA.[104] Assuming that O&M costs remain at $4 per capita, the annual O&M costs would be $17,000 under UCA and $13,000 under the RCA.

Solid Waste Disposal. Solid waste disposal would probably continue to be handled by a private contractor. The contractor, who terminated his services in July, charged the City approximately $12 per capita annually to collect and dispose of solid waste. The annual costs to the City would be $51,300 under UCA and $41,300 under RCA.

Parks and Recreation. According to the recreation standards, the City has adequate facilities in most types of recreation for the population increase. It has tennis courts, basketball courts, and a swimming pool. The park district contributed $3,000 to the $6,000 budget for the swimming pool in FY 1973. The park district plans to build an intensive use park (less than one acre) with a baseball field and has accumulated most of the needed funds. We anticipate that the developers of subdivisions will be required to build neighborhood facilities as part of their complexes. We also think that the residents of Hazen might wish to invest in winter recreation facilities, but we have not attempted to define the type of facility. Thus the only cost increase that we anticipate at this time is O&M. Assuming that these costs remain at $9 per capita, the annual costs would be $38,500 under UCA and $31,000 under RCA.

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[103] The State Department of Health estimates the cost of lagoon expansion at $6,000/acre. The above cost estimate reflects a 75 percent grant under the 1972 Federal Water Pollution Control Act.

[104] The annual debt service is based on a 20-year bond at 6¼ percent.

Revenues

Real Property Tax. The City received $30,800 in real property tax as receipts for both general and special purpose activities in FY 1973. The taxable value was $564,000, and the mill levy was 54.7. The City taxable value is estimated to increase as a result of new residential housing units to $3.2 million under UCA and to $2.5 million under RCA. Assuming the same mill levy, the annual revenue to the City would be $177,800 under UCA and $137,100 under RCA.

Personal Property Replacement. The City received $6,800 in personal property replacement as a receipt for both general and special purpose activities. The personal property replacement is based on one-seventh of the change in real property tax over $22,000, plus $5,800. Real property tax is calculated for the purpose of determining personal property tax on the basis of a residential taxable value of $541,400 rather than a total taxable value of $564,000. Real property tax in this case would have been $29,800. One-seventh of the difference between $29,800 and $22,000, or $1,100, plus $5,800 resulted in personal property replacement of $6,800. The City taxable value subject to personal property replacement is estimated to increase as a result of new residential housing units to $3.2 million under UCA and to $2.5 million under RCA. Real property tax, assuming a 54.7 mill levy, would be $176,600 under UCA and $135,800 under RCA. One-seventh of the difference between the estimated real property tax and the base real property tax, plus $5,800, would result in personal replacement of $26,800 under UCA and $20,900 under RCA.

Co-op Replacement. Hazen received $8,200 in energy receipts in FY 1973. These receipts were derived from a two percent tax on gross receipts of the two rural electric generating cooperatives in the County, Basin Electric and United Power Association. Of all Mercer County receipts, 15 percent were allocated to cities in the County according to their populations. Since the new lignite development, which would include the nearly completed expansion of the Basin Electric plant, is not included in revenue calculations for the cities, the total receipts available to the cities would remain approximately the same. However, we have estimated that Hazen's share of the total receipts would increase to $9,400 under UCA and to $8,900 under RCA because it would house a larger share of the total city population in the County.

Other Property Tax Receipts. Hazen received $3,000 in other property receipts in FY 1973. These receipts were derived from such sources as the building and loan, mobile home, and bank taxes. We estimate that they would increase by the same percentage as the population increased. The annual revenue would be $10,300 under UCA and $8,300 under RCA.

Beer and Liquor Tax. The tax generates $4 per capita in City revenue. The annual revenue would be $17,100 under UCA and $13,800 under RCA.

Cigarette Tax. The tax generates $5 per capita in City revenues. The annual revenue would be $21,400 under UCA and $17,200 under RCA.

Highway Fund. The City receives a payment from the State based on the number of registered vehicles in the County and the percentage of Mercer County city population living in Hazen. In the section on County government we estimated that the annual revenue would be $39,000 under UCA and $37,000 under RCA.

Revenue Sharing. The City receives an average of $10 per capita from the Federal Government. The annual revenue would be $42,800 under UCA and $34,400 under RCA.

Miscellaneous. Hazen received $4,400 in mixed sources of revenue in FY 1973. These sources consisted of such items as fines, forfeits, rents, dog and bicycle licenses, and sale of cemetery lots. Assuming that this source of revenue would remain at $4 per capita, the annual revenue would be $17,100 under UCA and $13,800 under RCA.

Utility Services. City utility services (water, sewer, and solid waste) generate their own revenues. The water revenue is $20 per capita, which means that the annual revenue would be $85,600 under UCA and $68,900 under RCA. The sewer revenue is $4 per capita, which means that the annual revenue would be $17,100 under UCA and $13,800 under RCA. The solid waste disposal revenue is $12 per capita, which means that the annual revenue would be $51,400 under UCA and $41,300 under RCA.

Parks. Revenues for the park system are derived from a nine-mill levy on the City taxable value and the personal property replacement. The City taxable value is estimated to increase as a result of new residential housing to $3.2 million under UCA and to $2.5 million under RCA. Assuming a nine-mill levy, the annual revenue to the City would be $28,800 under UCA and $22,500 under RCA. The personal property replacement is based on one-seventh of the change in real property tax over $4,700, plus $1,200. It is calculated on the same taxable base as the City personal property replacement. The annual revenue would be $5,000 under UCA and $4,300 under RCA. Other sources of receipts (rental and excess funds) are assumed to increase to $4,000 under UCA and $3,000 under RCA. (If not, the park district could reduce its contribution for operation of the swimming pool.) Total park district receipts under UCA would be $37,800 and under RCA would be $30,800.

Impact on City Finances

The City had an adequate financial base in FY 1973 to support city services. It operated with a surplus in both general and utility services. Only the park district operated at a deficit, and this deficit was probably covered by excess funds.

We have estimated that the City would have an adequate financial base to provide the services required by the new residents. It would operate under two different population projections with significant surpluses in both the general and utility services accounts, and with only a slight deficit in the park district. The latter could be corrected by a small increase in the mill levy.

However, we were surprised that the City would have an adequate financial base essentially on the increase in per capita State transfers, per capita tax receipts, and additional taxable value generated by residential activity. The increased taxable value of industrial and commercial activities apparently would not be needed to cover the increased costs of city services. In fact, the City could decrease the mill levy on real property.

The importance of revenue sharing and other Federal financial assistance should not be overlooked. Revenue sharing receipts account for 40 percent of the surplus in the general activities. The surplus in utility services would be reduced by more than 50 percent if the City paid the full cost of its sewer system rather than 25 percent.

Stanton

The previous chapter described the physical plant supporting Stanton's public services and excess capacity, if any, to accommodate new population.

The FY 1973 Stanton city and special district budgets indicate that the City offered a wide range of services and received funds from several sources (Table 6.14). The city services have been grouped into general and utility services in order to distinguish between activities primarily dependent upon taxes and transfer payments and those primarily dependent upon user charges. The park district is presented as an independent unit because its receipts are derived from a special mill levy.

The format of the following analysis is to present first the costs of all services and

TABLE 6.14 Stanton City and Special District Budgets for FY 1973

Receipts		Expenditures				Surplus (Deficit)
			Debt Service[b]	O & M	Total	
GENERAL SERVICES						
Real Property Tax[a]	$ 9,000	General Government	$ --	$ 9,900	$ 9,900	$
Personal Property[a] Replacement	1,700	Police	--	4,400	4,400	
		Fire	--	200	200	
Co-op Replacement	3,400	Streets and Alleys	--	6,600	6,600	
Other Property Tax	800	Street Lighting	--	2,100	2,100	
Beer and Liquor Tax	2,200	Swimming Pool Contribution	--	--	--	
Cigarette Tax	2,500	Convention Center	--	--	--	
Highway Fund	6,700	Miscellaneous	--	300	300	
Revenue Sharing	4,200					
Federal Assistance	--					
Miscellaneous	1,700					
SUBTOTAL	$ 32,200		$ --	$ 23,500	$ 23,500	$ 8,700
UTILITY SERVICES						
Water User Charges	$ --	Water User Charges	$ --	$ --	$ --	$
Water Assessment	--	Water Assessment	--	--	--	
Sewer	5,800	Sewer	2,300	2,200	4,500	
Solid Waste Disposal	4,500	Solid Waste Disposal	--	3,700	3,700	
SUBTOTAL	$ 10,300		$ 2,300	$ 5,900	$ 8,200	$ 2,100
TOTAL	$ 42,500		$ 2,300	$ 29,400	$ 31,700	$ 10,800
PARK DISTRICT						
Real Property	$ 1,100	Maintenance	$ --	$ 1,100	$ 1,100	$
Personal Property Replacement	200					
Other	--					
TOTAL	$ 1,300		$ --	$ 1,100	$ 1,100	$ 200

a Includes receipts raised for general services, bond sinking and interest fund, social security and cemetery. This does not include special assessment.

b Special assessment debt for streets is not included in our analysis because it is not part of city-wide debt. Special assessments on new residential property (streets, curbs and water and sewer lines) are included in the cost of residential lots.

then the revenues available to support those services. The differential effect of UCA and RCA are detailed under each service entry. The cost and revenue data are presented in separate budgets for each assumption. Then there is a discussion of the projected impact.

Costs

General Government Services. The city hall could accommodate the increased activity resulting from the new population. The current cost (just O&M) of general government services is $19 per capita (517 population). We anticipate that it would fall to $13 per capita given a larger population.[105] Consequently, the annual costs (just O&M) would be $10,400 under UCA (803 persons) and $9,300 under the RCA (718 persons) (Tables 6.15 & 6.16).

Police Protection. The City currently has a full time policeman and shares a deputy sheriff with Pick City. According to the police protection standards, the City would have adequate police protection under either growth assumption. Full-time police protection would cost $12,000 per policeman if he is paid at a level comparable to other law enforcement officers in the County.[106] Thus the annual cost would be $12,000 under UCA and $12,000 under RCA.

Fire Protection. The City has a physical plant adequate to serve a population of 9,600. Thus it could accommodate the population increase under both UCA and RCA. The cost of fire protection is currently less than $1 per capita and would probably increase to $1 per capita as the City size increases. Thus the annual costs would be $800 under UCA and $700 under RCA.

Streets and Alleys. The cost of maintaining streets and alleys is estimated to increase to $13 per capita.[107] Thus the annual costs would be $10,400 under UCA and $9,500 under RCA. In addition, the City would have to invest in a limited number of traffic control measures for the increased population; these costs are not included in the annual costs. However, the City would not have to invest in upgrading its main thoroughfares because the major highway by-passes the City.

Street Lighting. The cost of street lighting is assumed to continue at $4 per capita.[108] Thus the annual costs would be $3,200 under UCA and $2,900 under RCA.

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[105] The cost in Underwood (781) is $14 per capita and in Turtle Lake (712) $12 per capita.

[106] Since this cost is higher than in Stanton now and higher in comparable cities like Underwood and Turtle Lake, Stanton might only retain the policeman part-time.

[107] The FY 1972 cost was only $3 per capita even though the city received $8 per capita from the State. The $13 per capita cost is comparable to the cost in Underwood and Turtle Lake.

[108] The same per capita cost held in Turtle Lake.

TABLE 6.15 Stanton City and Special District Budget for Mid 1980's, Urban Concentration Assumption

Receipts		Expenditures	Debt Service	O & M	Total	Surplus (Deficit)
GENERAL SERVICES						
Real Property Tax	$ 24,200	General Government	$ --	$ 10,400	$ 10,400	$
Personal Property Replacement	3,900	Police	--	12,000	12,000	
		Fire	--	800	800	
Co-op Replacement	3,400	Streets and Alleys	--	10,400	10,400	
Other Property Tax	1,200	Street Lighting	--	3,200	3,200	
Beer and Liquor Tax	3,300	Swimming Pool Contribution	--	--	--	
Cigarette Tax	4,000	Convention Center	--	--	--	
Highway Fund	7,000 [a]	Miscellaneous	--	800	800	
Revenue Sharing	8,000					
Federal Assistance	--					
Miscellaneous	2,400					
SUBTOTAL	$ 57,400		$ --	$ 37,700	$ 37,700	$ 14,700
UTILITY SERVICES						
Water User Charges	$ 17,700	Water User Charges	$ 28,000	$ 12,000	$ 40,000	$
Water Assessment		Water Assessment				
Sewer	8,800	Sewer	2,700	3,200	5,900	
Solid Waste Disposal	7,200	Solid Waste Disposal	--	4,800	4,800	
SUBTOTAL	$ 33,700		$ 30,700	$ 20,000	$ 50,700	$ (17,000)
TOTAL	$ 91,100		$ 30,700	$ 57,700	$ 88,400	$ 2,700
PARK DISTRICT						
Real Property	$ 3,000	Maintenance	$ --	$ 1,600	$ 1,600	$
Personal Property Replacement	400					
Other	--					
TOTAL	$ 3,400		$ --	$ 1,600	$ 1,600	$ 1,800

a. These total to $26,000. The per capita revenue is $32.

TABLE 6.16 Stanton City and Special District Budgets for Mid 1980's, Rural Concentration Assumption

Receipts			Expenditures	Debt Service	O & M	Total	Surplus (Deficit)
GENERAL SERVICES							
Real Property Tax	$ 19,100		General Government	$ --	$ 9,300	$ 9,300	$
Personal Property			Police				
Replacement	3,200		Fire	--	12,000	12,000	
Co-op Replacement	3,400		Streets and Alleys	--	700	700	
Other Property Tax	1,100		Street Lighting	--	9,500	9,500	
Beer and Liquor			Swimming Pool				
Tax	2,900		Contribution	--	2,900	2,900	
Cigarette Tax	3,600	a	Convention Center	--	--	--	
Highway Fund	8,000		Miscellaneous	--	700	700	
Revenue Sharing	7,200						
Federal Assistance	--						
Miscellaneous	2,200						
SUBTOTAL	$ 50,700			$ --	$ 35,100	$ 35,100	$ 15,600
UTILITY SERVICES							
Water User Charges	$ 16,000		Water User Charges	$ 28,000	$ 10,800	$ 38,800	$
Water Assessment			Water Assessment				
Sewer	7,700		Sewer	2,700	2,900	5,600	
Solid Waste Disposal	6,600		Solid Waste Disposal		4,400	4,400	
SUBTOTAL	$ 30,300			$ 30,700	$ 18,100	$ 48,800	$ 18,500
TOTAL	$ 81,000			$ 30,700	$ 53,200	$ 83,900	$ (2,900)
PARK DISTRICT							
Real Property	$ 2,400		Maintenance	$ --	$ 1,400	$ --	$
Personal Property							
Replacement	300						
Other	--						
TOTAL	$ 2,700			$ --	$ 1,400	$ --	$ 1,300

a These total to $25,000. The per capita revenue is $35.

Miscellaneous. At this time this category includes only building permits, dog licenses, and cemetery maintenance. The per capita cost is approximately $1. Assuming that the per capita cost remains at $1, the annual costs would be $800 under UCA and $700 under RCA.

Water. While the citizens of Stanton recently turned down a bond referendum on water supply, we anticipate that they would need to install a system by the 1980's. Banks are reluctant to finance sizeable housing developments in communities without a central water supply, and insurance rates are considerably higher. A water supply system adequate to serve both UCA and RCA populations is estimated to cost $350,000.[109] (The cost could be greater given more extensive water purification and installation of an elevated water tank.) The annual debt service on this investment would be $28,000. The O&M costs are assumed to be similar to those in Beulah, or $15 per capita. The annual O&M costs would be $12,000 under UCA and $10,800 under RCA.

Sewer. The lagoon system essentially has no excess capacity. It would have to be expanded to serve an additional 286 people under UCA and 211 under the RCA. A three-acre expansion would accommodate UCA residents or RCA residents. At a cost of $1,500 per acre, the City investment would be $4,500 to serve both UCA and RCA residents.[110] The annual debt service costs (principal and interest) would be $400.[111] Assuming that O&M costs remain at $4 per capita, the annual O&M costs would be $3,200 under UCA and $2,900 under RCA.

Solid Waste Disposal. Solid waste disposal would probably continue to be handled by a private contractor. The contractor who terminated his services in July charged the City approximately $6 per capita annually to collect and dispose of solid waste. The annual cost to the City would be $4,800 under UCA and $4,400 under RCA.

Parks and Recreation. According to the recreation standards, the City has adequate open space and recreation facilities, including a combined basketball and tennis court, to handle the increased population. We anticipate that the developers of subdivisions will be required to build neighborhood facilities as part of their complexes. Assuming that the O&M costs for the existing facilities remain at $2 per capita, the annual O&M costs would be $1,600 under UCA and $1,400 under RCA.

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[109] This estimate was supplied by Consulting Engineers Diversified, Bismarck. The capital cost to the City would be lower if it received a grant from the Farmers Home Administration.

[110] The State Department of Health estimates the cost of lagoon expansion at $6,000/acre. The above estimate reflects a 75 percent grant under the 1972 Federal Water Pollution Control Act.

[111] The annual debt service is based on a 20-year bond at 6¼ percent.

Revenues

Real Property Tax. The City received $9,000 in real property tax as receipts for both general and special purpose activities in FY 1972. The taxable value was $161,000, and the mill levy was 55.7. The City taxable value is estimated to increase as a result of new residential housing units to $431,000 under UCA and $341,000 under RCA. Assuming the same mill levy, the annual revenue to the City would be $24,200 under UCA and $19,100 under RCA.

Personal Property Replacement. The City received $1,700 in personal property replacement as a receipt for both general and special purpose activities. The personal property replacement is based on one-seventh of the change in real property tax over $6,200, plus $1,400. Real property tax is calculated for the purpose of determining personal property replacement on the basis of residential taxable value of $151,000 rather than total taxable value of $161,000. Real property tax in this case would have been $8,500. One-seventh of the difference between $8,500 and $6,200, or $300, plus $1,400, resulted in a personal property replacement of $1,700. The City taxable value subject to personal property replacement is estimated to increase as a result of new residential housing units to $421,000 under UCA and $331,000 under RCA. Real property tax, assuming a 55.7 mill levy, would be $23,500 under UCA and $18,500 under RCA. One-seventh of the difference between the estimated real property tax and the base real property tax, plus $1,400, would result in personal property replacement of $3,900 under UCA and $3,200 under RCA.

Co-op Replacement. Stanton received $3,400 in energy receipts in FY 1973. These receipts were derived from a two percent tax on gross receipts of two rural electric generating cooperatives in the County, Basin Electric and United Power Association. Of all the Mercer County receipts, 15 percent were allocated to cities in the County according to their populations. Since the new lignite development, which would include the nearly completed expansion of the Basin Electric plant is not included in revenue calculations for the cities, the total receipts to the cities would remain at approximately the same amount. We have estimated that Stanton's share of the total receipts would remain at $3,400 under UCA and RCA because it would contain approximately the same percentage of the city population of the County.

Other Property Tax Receipts. Stanton received $800 in other property tax receipts in FY 1972. These receipts were derived from such sources as the building and loan, mobile home, and bank taxes. We estimate that they would increase by the same percentage as the population increased. The annual revenue would be $1,200 under UCA and $1,100 under RCA.

Beer and Liquor Tax. The tax generates $4 per capita in City revenue. The annual revenue would be $3,300 under UCA and $2,900 under RCA.

Cigarette Tax. The tax generates $5 per capita in City revenue. The annual revenue would be $4,000 under UCA and $3,600 under RCA.

Highway Fund. The City receives a payment from the State based on the number of registered vehicles in the County and the percentage of Mercer County city population living in Stanton. In the section on County government, we estimated that the annual revenue would be $7,000 under UCA and $8,000 under RCA.

Revenue Sharing. The City receives an average of $10 per capita from the Federal Government. The annual revenue would be $8,000 under UCA and $7,200 under RCA.

Miscellaneous. Stanton received $1,700 in mixed sources of revenue in FY 1973. These sources included such items as fines, forfeits, and rents. Assuming that this source of revenue would remain at $3 per capita, the annual revenue would be $2,400 under UCA and $2,200 under RCA.

Utility Services. The City utility services (the proposed water system, sewer system, and solid waste collection) generate their own revenues.[112] The water revenue is estimated to be similar to that in Beulah, or $22 per capita, which means that the annual revenues would be $17,700 under UCA and $16,000 under RCA. The sewer revenue is estimated to be $11 per capita, which means that the annual revenue would be $8,800 under UCA and $7,700 under RCA. The solid waste disposal revenue is $9 per capita, which means the annual revenue would be $7,200 under UCA and $6,600 under RCA.

Parks. Revenues for the park system are derived from a seven-mill levy on the City taxable value and the personal property replacement. The City taxable value is estimated to increase as a result of new residential housing to $431,000 under UCA and $341,000 under RCA. Assuming a seven-mill levy, the annual revenue to the City would be $3,000 under UCA and $2,400 under RCA. The personal property replacement is based on one-seventh of the change in real property tax over $600, plus $100. It is calculated on the same taxable base as the City personal property replacement. The annual revenue would be $400 under the UCA and $300 under RCA.

Impact on City Finances

The City had an adequate financial base in FY 1972 to support city services. It operated with a surplus in both general and utility services and the park district.

The impact of development initially appears not as favorable to Stanton as it would be to Beulah and Hazen. Stanton would have an adequate financial base to provide general services required by the new residents. In fact, the surplus receipts constitute a greater percent of total receipts than in either Beulah or Hazen. However, Stanton would find it difficult to cover the deficit resulting from an investment in a water supply system. The general activities surplus is sufficient to cover the deficit in utility services under UCA but not sufficient under RCA. The only options would appear to be (a) a very high user charge, (b) Federal grant and loan assistance from Farmers Home Administration, or (c) no investment in a water supply system.

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[112] We have not considered either the expenditures or receipts associated with the municipal power system.

The impact of revenue sharing and other Federal financial assistance is not as noticeable in Stanton as in Beulah and Hazen, but it is still important. Revenue sharing is only a third of the surplus receipts in general activities. The surplus in the sewer service program would be reduced by 50 percent if the City paid 100 percent rather than 25 percent of the cost of the lagoon.

School District Costs and Revenues

Ten different school districts serve Mercer County children—Beulah, Dodge, Glen Ullin, Hazen, Hebron, Juzeler, Riverdale, Stanton, Twin Buttes, and Zap. Five school districts—Beulah, Hazen, Juzeler, Stanton, and Zap—provide educational services to approximately 90 percent of the children and would probably be the ones affected by lignite development. Two smaller districts, Juzeler (130 students) and Zap (120 students), might be significantly changed because current enrollments barely maintain accredited school districts. A doubling of enrollments would enhance their viability as school districts. However, no technique was available for assigning children to these two districts because the cities of Golden Valley and Zap were not explicitly accounted for in the gravity model. They were included in the rural category, which means that we were unwilling to state whether their new population would live in small towns or the countryside. Consequently, the impact analysis is limited to the three primary school districts, Beulah, Hazen, and Stanton. They account for over 70 percent of the current enrollment in the County school districts, and the effects of lignite development on their activities are probably representative of the impact in the othe. districts.

Beulah School District

The FY 1973 enrollment in the Beulah district was 516 average daily members (ADM). Enrollment in kindergarden through 8th grade accounted for 350 ADM and in grades 9-12 for 166 ADM. There was a surplus capacity of 102 ADM in K-8 and 48 in 9-12.[113]

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[113] North Dakota, Department of Public Instruction, mimeo sheet, February 1974.

The FY 1973 variable expenditures were $398,000 (Table 6.17).[114] Elementary education accounted for $239,000, and the cost per ADM was $683. Secondary education accounted for $159,000, and the cost per ADM was $975. The FY 1973 fixed expenditures were $30,000 or $58 per ADM.[115] Elementary education accounted for $20,000 and secondary education for $10,000. The total K-8 expenditures were $259,000 or $740 per ADM, and the total 9-12 expenditures were $169,000 or $994 per ADM.

The receipts to be applied against the variable expenditures were $412,000. The primary sources of these revenues were the district property tax and the State foundation program. The fixed receipts were $68,000; the two sources were the real property tax and personal property replacement.

Urban Concentration Assumption. Under UCA, the mid-1980's school enrollment would be 1,424–1,014 students in K-8 and 410 in 9-12. The annual variable cost would be $693,000 for K-8 and $392,000 for 9-12 (Table 6.18). The annual fixed costs for part of that enrollment using the present facilities would be $16,000 for K-8 and $8,000 for 9-12.[116] The annual fixed costs for that part of the enrollment using the new facilities would be $120,000 for K-8 and $61,000 for 9-12.[117] The total annual fixed costs would be $136,000 for K-8 and $69,000 for 9-12. The total expenditures for the 1980's enrollment would be $1.3 million.

Local, County, State, and Federal receipts would be available to offset the increased variable expenditures. The FY 1973 school district taxable value was $2.3 million. We estimate it would increase to $5.3 million under UCA due to the increased number of residential units. Applying a mill levy of 46.8 to that taxable value would result in $249,000 in receipts to be applied against variable expenditures. Other local sources and co-op replacement receipts fund are assumed to remain at their FY 1973 level. The County equalization fund is based on the Beulah school district's share (determined by the number of students in

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[114] Variable expenditures were taken from the clerk's annual report for FY 1973. They include: administration, instruction, health services, pupil transportation services, operation of plant and equipment, maintenance of plant and equipment, fixed charges, food service, student body activities, capital outlay for equipment, social security, and teacher's insurance and retirement.

[115] Fixed expenditures were taken from the treasurer's annual report. They include: building fund, construction proceeds fund, sinking and interest fund, and special assessments.

[116] The part of the enrollment that would not need new physical capacity would be the current K-8 ADM of 350 plus the surplus of 102 ADM or a total of 452, and the current 9-12 ADM of 166 plus the surplus of 48 ADM or a total of 214. The total fixed cost in this case is not the $30,000 in the FY 73 budget, but only $24,000. The $6,000 in the building fund could be used to retire the new debt. There still would be a need for physical capacity of 562 ADM in K-8 and 196 in 9-12.

[117]

	Students	Square Feet/ Student[a]	Cost/ Student	Total Cost	Annual Debt Service[b]
K-8	562	85	$2,550	$1,433,000	$120,000
9-12	196	125	3,750	735,000	61,000

[a] North Dakota Department of Public Instruction

[b] The annual debt service cost is based on a 5-1/2 percent interest rate and a 20-year retirement period.

TABLE 6.17 Beulah School District Budget for FY 1973

	Receipts				Expenditures			Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax	$ 49,000	$ 127,000	$ 176,000	Elementary	$ 20,000	$ 239,000	$ 259,000	
Other Local Sources	--	31,000	31,000	Secondary	10,000	159,000	169,000	
Co-op Replacement	--	26,000	26,000					
County Equalization	--	43,000	43,000					
State Tuition Apportionment	--	15,000	15,000					
State Foundation Program	--	107,000	107,000					
Personal Property Replacement	21,000	53,000	74,000					
Federal Funds	--	10,000	10,000					
TOTAL	$ 70,000	$ 412,000	$ 482,000		$ 30,000	$ 398,000	$ 428,000	$ 54,000

TABLE 6.18 Beulah School District Budget for Mid 1980's Urban Concentration Assumption

	Receipts				Expenditures			Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax[a]	$ 106,000	$ 249,000	$ 355,000	Elementary	$ 136,000	$ 693,000	$ 829,000	
Other Local Sources	--	31,000	31,000	Secondary	69,000	392,000	461,000	
Co-op Replacement	--	26,000	26,000					
County Equalization	--	114,000	114,000					
State Tuition Apportionment	--	43,000	43,000					
State Foundation Program	--	593,000	593,000					
Personal Property Replacement	--	--	--					
Federal Funds	--	27,000	27,000					
TOTAL	$ 106,000	$ 1,083,000	$ 1,189,000		$ 205,000	$1,085,000	$1,290,000	$(101,000)

a. Does not include mutual telephone tax, building and loan, mobile home, and bank taxes.

the district compared to the number in the County) of a 21-mill levy applied to the new taxable value in the County of $12.9 million. The share is estimated to be $114,000.[118] The State tuition apportionment is a payment of approximately $30 per child times the number of children between the ages of 6 and 17 in the school district. The payment is estimated to be $43,000. The State foundation program includes an educational payment of $497 per K-8 ADM, an educational payment of $713 per 9-12 ADM, and a transportation payment of $31 per ADM.[119] The potential total education payment of $796,000 is reduced by the Country equalization payment, a 20-mill levy applied against the new taxable value in the school district, and supplemental payments from the Federal Government. The County equalization payment is $114,000; a 20-mill levy on the new taxable value ($5.3 million) in the school district gives a yield $106,000; and Federal payments under the Elementary and Secondary Education Act are $27,000.[120] Thus, the State is estimated to pay $593,000–$549,000 in educational payments and $44,000 in transportation payments. The school district would no longer receive personal property replacement receipts. The total receipts available to pay variable expenditures are estimated to be $1.1 million.

District property tax receipts would be available to offset the increased fixed expenditures. The mid-1980's school district taxable value is estimated to increase to $5.8 million under UCA. Applying the current 20-mill levy for the building and sinking and interest funds would generate receipts of $106,000. The school district would no longer receive personal property replacement receipts to be applied against fixed expenditures. Thus total receipts available to pay fixed expenditures are estimated to be $106,000. The total receipts available from all sources are $1.2 million.

Whereas the Beulah school district was able to operate with surplus receipts in FY 1973 because of excess revenue generated by receipts for fixed expenditures, we have estimated that it would operate with a deficit in the mid-1980's because the State foundation program is essentially unable to cover the large increase in fixed costs. The program does not even cover the variable expenditures. However, this predicted deficit is very misleading because the district taxable value does not take into account the taxable value of lignite development in the County and of retail trade outlets in Beulah. The former could increase the real property tax receipts from an estimated $355,000 to $4.1 million (Table 6.27). This would provide more than ample receipts to cover expenditures. In addition, the district could cover the deficit by increasing the mill levy and by borrowing monies from the State for school construction.

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[118] Under UCA the Beulah school district would have 42 percent of the students (Table 5.12), so that it would receive 42 percent of the equalization fund.

[119] The State has significantly altered its foundation program since FY 1973. Essentially, the State substantially increased the per pupil payment and eliminated personal property replacement, which was paid from the State general fund. The total pupil payment is reduced by a 20-mill levy applied against the taxable value in the school district and by supplemental payments from the Federal Government. The new procedure for the foundation program is used in the 1980's budget analysis because it is more representative of how the system will work at that time.

[120] The Federal payments are assumed to remain at $19 per ADM. They are actually for special categories of children and are much higher on an ADM basis if calculated on that population alone.

Rural Concentration Assumption. Under RCA the mid-1980's school enrollment would total 1,193–845 in K-8 and 348 in 9-12. The annual variable costs for the K-8 enrollment would be $577,000 and for the 9-12 enrollment would be $333,000.[121] (Table 6.19). The total annual variable costs would be $910,000. The annual fixed costs for that part of the enrollment using the present facilities would be $16,000 for K-8 and $8,000 for 9-12. The annual fixed costs for that part of the enrollment using the new facility would be $84,000 for K-8 and $45,000 for 9-12.[122] The total annual fixed costs for K-8 would be $100,000 and for 9-12 would be $53,000. The total annual fixed costs for both categories would be $153,000. The total expenditures for the 1980's enrollment would be $1.1 million.

Local, County, State, and Federal receipts would be available to offset the increased variable costs. We estimate that the school district taxable value would be $4.6 million under RCA. The estimated receipts are calculated on the same basis as under UCA. The total funds available to pay variable costs are estimated to be $903,000.

District property tax revenues would be available to offset the increased fixed costs. The estimated receipts are calculated on the same basis as under UCA. The total funds available to pay fixed costs are estimated to be $92,000. The total funds available from all sources are $995,000.

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[121] The rationale for the receipt and expenditure numbers is abbreviated because it was explained earlier.

[122]

	Students	Square Feet/ Student[a]	Cost/ Student[a]	Total Cost	Annual Debt Service[b]
K-8	393	85	$2,550	$1,002,150	$83,660
9-12	144	125	3,750	540,000	45,090

[a] North Dakota Department of Public Instruction

[b] The annual debt service cost is based on a 5-1/2 percent interest rate and a 20-year retirement period.

TABLE 6.19 Beulah School District Budget for Mid 1980's, Rural Concentration Assumption

	Receipts				Expenditures			Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax	$ 92,000	$ 216,000	$ 308,000	Elementary	$ 100,000	$ 577,000	$ 677,000	
Other Local Sources	--	31,000	31,000	Secondary	53,000	333,000	386,000	
Co-op Replacement	--	26,000	26,000					
County Equalization	--	95,000	95,000					
State Tuition Apportionment	--	36,000	36,000					
State Foundation Program	--	476,000	476,000					
Personal Property Replacement	--	--	--					
Federal Funds	--	23,000	23,000					
TOTAL	$ 92,000	$ 903,000	$ 995,000		$ 153,000	$ 910,000	$ 1,063,000	$ (68,000)

Whereas the Beulah school district was able to operate with surplus receipts in FY 1973 because of excess revenue generated by receipts for fixed expenditures, we have estimated that it would operate with a deficit in the mid-1980's because the State foundation program is essentially unable to cover the large increase in fixed costs. However, we would reiterate that any predicted deficit is very misleading because the district taxable value does not take into account the taxable value of the lignite development in the County and of retail trade outlets in Beulah, as well as the potential of borrowing monies from the State for school construction.

Hazen School District

The FY 1973 enrollment in the Hazen district was 497 ADM–324 ADM in K-8 and 173 ADM in 9-12. There was a surplus capacity of 91 ADM in K-8 and 49 ADM in 9-12.[123]

The FY 1973 variable expenditures were $343,000 (Table 6.20). Elementary education accounted for $167,000, and the cost per ADM was $515. Secondary education accounted for $176,000, and the cost per ADM was $1,017. The FY 1973 fixed expenditures were $24,000 or $48 per ADM. Elementary education accounted for $16,000 and secondary education for $8,000. The total K-8 expenditures were $183,000 or $574 per ADM, and the total 9-12 expenditures were $184,000 or $1,046 per ADM.

The receipts to be applied against the variable expenditures were $302,000. The primary sources of revenue were the district property tax and the State foundation program. The fixed receipts were $40,000; the two sources of revenue were the real property tax and personal property replacement. The total receipts were $342,000.

For the FY 1973 the Hazen school district closed its books with a deficit. While the fixed receipts covered the fixed expenditures and provided surplus receipts for other purposes, the variable receipts fell below the variable expenditures. One reason the receipts were low was that the general mill levy was only 39.43, versus 46.8 in the Beulah school district and 54.7 in the Stanton school district. The Hazen school district covered the deficit by borrowing $73,000 against anticipated tax receipts.

Urban Concentration Assumption. Under UCA, the mid-1980's school enrollment would be 1,287 ADM–901 in K-8 and 386 in 9-12. The annual variable costs would be $464,000 for K-8 and $393,000 for 9-12 (Table 6.21). The annual fixed cost for that part of the enrollment using the present facilities would be $8,000 for K-8 and $5,000 for

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[123] North Dakota, Department of Public Instruction, mimeo sheet, February 1974.

TABLE 6.20 Hazen School District Budget for FY 1973

	Receipts				Expenditures			Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax	$ 31,000	$ 79,000	$ 110,000	Elementary	$ 16,000	$ 167,000	$ 183,000	
Other Local Sources	--	18,000	18,000	Secondary	8,000	176,000	184,000	
Co-op Replacement	--	25,000	25,000					
County Equalization	--	28,000	28,000					
State Tuition Apportionment	--	14,000	14,000					
State Foundation Program	--	94,000	94,000					
Personal Property Replacement	9,000	22,000	31,000					
Federal Funds	--	22,000	22,000					
TOTAL	$ 40,000	$ 302,000	$ 342,000		$ 24,000	$ 343,000	$ 367,000	$ (25,000)

TABLE 6.21 Hazen School District for Mid 1980's, Urban Concentration Assumption

	Receipts				Expenditures			Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax	$ 88,000	$ 220,000	$ 308,000	Elementary	$ 94,000	$ 464,000	$ 558,000	
Other Local Sources	--	18,000	18,000	Secondary	56,000	393,000	449,000	
Co-op Replacement	--	25,000	25,000					
County Equalization	--	103,000	103,000					
State Tuition Apportionment	--	39,000	39,000					
State Foundation Program	--	501,000	501,000					
Personal Property Replacement	--	--	--					
Federal Funds	--	57,000	57,000					
TOTAL	$ 88,000	$ 963,000	$1,051,000		$ 150,000	$ 857,000	$1,007,000	$ (44,000)

9-12.[124] The annual fixed cost for that part of the enrollment using the new facilities would be $86,000 for K-8 and $51,000 for 9-12.[125] The total annual fixed cost would be $94,000 for K-8 and $56,000 for 9-12. The total expenditures for the 1980's enrollment would be $1.0 million.

Local, County, State, and Federal receipts would be available to offset the increased variable expenditures. The FY 1973 school district taxable value was $1.7 million. We estimate it would increase to $4.4 million under UCA due to the increased number of residential units. Applying an assumed mill levy of 50.0, which is comparable to the levies in Beulah and Stanton School districts, to that taxable value would result in $220,000 in receipts to be applied against variable expenditures. Other local source revenues and co-op replacement receipts are assumed to remain at their FY 1973 levels. The County equalization fund is based on the Hazen school district's share (determined by the number of students in the district compared to the number in the County) of a 21-mill levy applied to the new taxable value in the County ($12.9 million). The share is estimated to generate $103,000.[126] The State tuition apportionment is a payment of approximately $30 per child times the number of children between ages 6 and 17 in the school district. The payment is estimated to be $39,000. The State foundation program includes an educational payment of $475 per K-8 ADM, an educational payment of $713 per 9-12 ADM, and a transportation payment of $31 per ADM. The potential total educational payment of $325,000 from the State is reduced by the County equalization payment, a 20-mill levy applied against the new taxable value in the school district, and supplemental payments from the Federal Government. The County equalization payment is $103,000; a 20-mill levy on the new taxable value ($4.4 million) in the school district gives a yield of $88,000; and Federal payments under the Elementary and Secondary Education Act are $57,000.[127]

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[124] The part of the enrollment that would not need new physical capacity would be the current K-8 ADM of 324 plus the surplus capacity of 91 ADM or a total of 415, and the current 9-12 ADM of 173 plus the surplus capacity of 49 ADM or a total of 222 ADM. The total fixed cost for this number would not be the $24,000 in the FY 1973 budget, but only $13,000. The $10,000 in the building fund could be used to retire the new debt. There would still be a need for physical capacity of 486 ADM in K-8 and 164 ADM in 9-12.

[125]

	Students	Square Feet/ Student[a]	Cost/ Student	Total Cost	Annual Debt Service[b]
K-8	486	85	$2,550	$1,035,300	$86,000
9-12	164	125	3,750	615,000	51,000

[a] North Dakota Department of Public Instruction

[b] The annual debt service cost is based on a 5-1/2 percent interest rate and a 20-year retirement period.

[126] The Hazen school district under UCA would have 38 percent of the students in the County (Table 5.12), so that it would receive 38 percent of the County equalization fund.

[127] Federal payments are assumed to remain at $44 per ADM.

Thus, the State is estimated to pay $501,000–$461,000 in educational payments and $40,000 in transportation payments. The total receipts available to pay variable expenditures are estimated to increase to $963,000.

District property tax receipts would be available to offset the increased fixed expenditures. The mid-1980's school district taxable value is estimated to increase to $4.4 million under UCA. Applying the current 19-mill levy for the building and sinking and interest funds would generate receipts of $88,000. The school district would no longer receive personal property replacement receipts to be applied against fixed expenditures. Thus the total receipts available to pay fixed expenditures would be $88,000. The total receipts available from all sources are $1.1 million.

The Hazen school district would operate in the mid-1980's with a surplus because the State foundation program would generate sufficient receipts to cover total expenditures. However, receipts would have to be shifted to cover fixed expenditures because the property tax receipts are insufficient to cover the fixed expenditure. In addition, the potential surplus would actually be greater than estimated because the district taxable value does not take into account the taxable value of lignite development in the County and of retail trade outlets in Hazen. The former could increase the estimated real property tax receipts from $308,000 to $643,000 (Table 6.27). This would provide more than ample receipts levy to cover disbursements.

Rural Concentration Assumption. Under RCA, mid-1980's enrollment would total 1,070–743 in K-8 and 327 in 9-12. The annual variable costs for the K-8 and 9-12 enrollments would be $383,000 and $333,000, respectively (Table 6.22). The annual fixed costs for that part of the K-8 enrollment using the present facilities would be $8,000 for K-8 and $5,000 for 9-12. The annual fixed cost for that part of the K-8 enrollment using new facilities would be $70,000, and for the other part of the 9-12 would be $33,000.[128] The total annual fixed costs for K-8 would be $78,000 and for 9-12 would be $38,000. The total expenditures for the 1980's enrollment would be $832,000.

Local, County, State, and Federal Revenues would be available to offset the increased variable costs. We estimate that the school district taxable value would be $3.6 million under RCA. The estimated receipts are calculated on the same basis as under UCA. The total funds available to pay variable costs are estimated to be $802,000.

[128]

	Students	Square Feet/ Student[a]	Cost/ Student[a]	Total Cost	Annual Debt Service[b]
K-8	328	85	$2,550	$836,400	$69,830
9-12	105	125	3,750	393,750	32,870

[a] North Dakota Department of Public Instruction

[b] The annual debt service cost is based on a 5-1/2 percent interest rate and a 20-year retirement period.

TABLE 6.22 Hazen District School Budget for Mid 1980's, Rural Concentration Assumption

	Receipts				Expenditures			Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax	$ 68,000	$ 180,000	$ 248,000	Elementary	$ 78,000	$ 383,000	$ 461,000	
Other Local Sources	--	18,000	18,000	Secondary	38,000	333,000	371,000	
Co-op Replacement	--	25,000	[illegible],000					
County Equalization	--	86,000	86,000					
State Tuition Apportionment	--	32,000	32,000					
State Foundation Program	--	414,000	414,000					
Personal Property Replacement	--	--	--					
Federal Funds	--	47,000	47,000					
TOTAL	$ 68,000	$ 802,000	$ 870,000		$ 116,000	$ 716,000	$ 832,000	$ 38,000

District property tax revenues would be available to offset the increased fixed costs. The estimated receipts are calculated on the same basis as under UCA. The total funds available to be applied against fixed costs are estimated to be $68,000. The total receipts available from all sources are $870,000.

The Hazen school district would operate in the mid-1980's with a surplus because the State foundation program would generate sufficient revenue to cover total expenditures. As in the UCA case, revenues would have to be shifted to cover fixed expenditures. We would add that the surplus would be larger than estimated because the district taxable value does not take into account the taxable value of lignite development in the County, retail outlets in Hazen, or an additional increase in the mill levy.

Stanton School District

The FY 1973 enrollment in the Stanton district was 219 ADM–156 ADM in K-8 and 63 ADM in 9-12. There was a surplus capacity of 72 ADM in K-8 and 26 ADM in 9-12.[129]

The FY 1973 variable expenditures were $162,000 (Table 6.23).[130] Elementary education accounted for $84,000, and the cost per ADM was $538. Secondary education accounted for $78,000, and the cost per ADM was $1,238. The FY 1973 fixed expenditures were $17,000 or $78 per ADM.[130] Elementary education accounted for $13,000 and secondary education accounted for $4,000. The total K-8 expenditures were $97,000 or $622 per ADM, and the total 9-12 expenditures were $82,000 or $1,302 ADM.

The receipts to be applied against the variable expenditures were $163,000. The primary sources of revenue were the district property tax and the State foundation program. The fixed receipts were $25,000; the two sources of revenue were the real property tax and personal property replacement. The total receipts were $188,000.

For FY 1973 the Stanton School district operated with a small surplus.

Urban Concentration Assumption. Under UCA the mid-1980's school enrollment would be 293 ADM–210 in K-8 and 83 in 9-12. The annual variable cost would be $113,000 for K-8 and $103,000 for 9-12 (Table 6.24). The annual fixed cost would be the same as the fixed costs in the FY 1973 budget because the new enrollment does not exceed the 329 ADM capacity of the school district.[131] The total expenditures for the 1980's enrollment would be $233,000.

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[129] North Dakota, Department of Public Instruction, mimeo, February 1974.

[130] The FY 1973 budget showed $43,000 in fixed expenditures. Since the $33,000 expenditure in the building fund was much greater than average, the statewide average of $75 per ADM was used as the basis for calculating fixed expenditures.

[131] The total K-8 ADM capacity is 228, which consists of the current 156 ADM plus the surplus capacity of 72 ADM. The total 9-12 ADM capacity is 89, which consists of the current 63 ADM plus the surplus capacity of 26 ADM.

TABLE 6.23 Stanton School District Budget for FY 1973

	Receipts			Expenditures				Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax	$ 17,000	$ 37,000	$ 54,000	Elementary	$ 13,000	$ 84,000	$ 97,000	
Other Local Sources	--	16,000	16,000	Secondary	4,000	78,000	82,000	
Co-op Replacement	--	16,000	16,000					
County Equalization	--	24,000	24,000					
State Tuition Apportionment	--	6,000	6,000					
State Foundation Program	--	37,000	37,000					
Personal Property Replacement	8,000	19,000	27,000					
Federal Funds	--	8,000	8,000					
TOTAL	$ 25,000	$ 163,000	$ 188,000		$ 17,000	$ 162,000	$ 179,000	$ 9,000

TABLE 6.24 Stanton School District Budget for Urban Concentration Assumption, Mid 1980's

	Receipts				Expenditures			Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax	$ 26,000	$ 46,000	$ 72,000	Elementary	$ 13,000	$ 113,000	$ 126,000	
Other Local Sources	--	16,000	16,000	Secondary	4,000	103,000	107,000	
Co-op Replacement	--	10,000	10,000					
County Equalization	--	24,000	24,000					
State Tuition Apportionment	--	9,000	9,000					
State Foundation Program	--	119,000	119,000					
Personal Property Replacement	--	--	--					
Federal Funds	--	11,000	11,000					
TOTAL	$ 26,000	$ 235,000	$ 261,000		$ 17,000	$ 216,000	$ 233,000	$ 28,000

Local, County, State, and Federal receipts would be available to offset the increased variable expenditures. The FY 1973 school district taxable value was $567,000. We estimate it would increase to $837,000 under UCA due to the increased number of residential units. Applying a mill levy of 54.7 to that taxable value would result in $46,000 in receipts to be applied against variable expenditures. Other local source revenues and co-op replacement revenues are assumed to remain at the FY 1973 levels. The county equalization fund is based on the Stanton school district's share (determined by the number of students in the district compared to the number in the County) of a 21-mill levy applied to the taxable value in the County ($12.9 million). The share is estimated to be $24,000.[132] The State tuition apportionment is a payment of approximately $30 per child times the number of children between ages 6 and 17 in the school district. The payment is estimated to be $9,000. The State foundation program includes an educational payment of $475 per K-8 ADM, an educational payment of $756 per 9-12 ADM, and a transportation payment of $31 per ADM. The potential total educational payment of $77,000 from the State is reduced by the County equalization payment, a 20-mill levy applied against the new taxable value in the school district, and supplemental payments from the Federal Government. The County equalization payment is $24,000; a 20-mill levy on the new taxable value($837,000)in the school district gives a yield of $17,000; and Federal payments under the Elementary and Secondary Education Act are $11,000.[133] Thus, the State is estimated to pay $119,000-$110,000 in education payments and $9,000 in transportation payments. The total receipts available to pay variable expenditures are estimated to be $235,000.

District property tax receipts would be available to offset the increased fixed expenditures. The mid-1980's school district taxable value is estimated to increase to $837,000 under UCA. Applying the current 31 mill levy for building, sinking and interest, and special assessment funds would generate receipts of $26,000 available to pay fixed expenditures. The school district would no longer receive personal property replacement receipts to be applied against fixed expenditures. The total receipts from all sources are $261,000.

The Stanton school district would operate in the mid-1980's with a budget surplus because the State foundation program would generate sufficient receipts to cover total expenditures. In this case, receipts would not have to be shifted to cover fixed expenditures because the property tax receipts are sufficient to cover fixed expenditures. The net fixed receipts would be sufficient to offset the deficit in variable expenditures. In addition, the potential surplus would actually be greater than estimated because the district taxable value does not take into account the taxable value of lignite development in the County and of retail trade outlets in Stanton. The former could increase the estimated real property tax receipts from $72,000 to $159,000 (Table 6.27). This would provide more than ample receipts to cover disbursements.

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[132] The Stanton School District under UCA would have nine percent of the students in the County (Table 5.12), so that it would receive nine percent of the equalization fund.

[133] Federal payments are assumed to remain at $44 per ADM.

Rural Concentration Assumption. Under RCA, the mid-1980's enrollment would total 274–196 in K-8 and 78 in 9-12. The annual variable costs for the K-8 enrollment would be $105,000 and for the 9-12 enrollment $96,000 (Table 6.25). The total annual fixed costs for the new enrollment would be the same as the total annual fixed costs for FY 1973 ($17,000) because the additional mid-1980's enrollment would not exceed the surplus capacity. The total expenditures for the 1980's enrollment would be $218,000.

Local, County, State, and Federal revenues would be available to offset the increased variable costs. We estimate that the school district taxable value would be $747,000 under RCA. The estimated receipts are calculated on the same basis as under UCA. The total funds available to pay variable costs are estimated to be $220,000.

District property tax receipts would be available to offset the increased fixed costs. The estimated receipts are calculated on the same basis as under UCA. The total funds available to be applied against fixed costs are estimated to be $23,000. The total receipts available from all sources would be $243,000.

The Stanton school district would operate in the mid-1980's with a surplus of $3,000 less than under UCA and with a surplus of $16,000 more than in FY 1973. The reason is that the State foundation program would generate sufficient receipts to cover total expenditures. In this case receipts would not have to be shifted to cover fixed expenditures. However, we would reiterate that the predicted amount of the surplus is very misleading because the district taxable value does not take into account the taxable value of lignite development in the County and retail trade outlets in Stanton.

Estimated Tax Revenues Derived From Lignite Utilization and Mining Facilities[134]

The proposed lignite development facilities will form the basis for a large increase in the local tax revenues. The following section estimates the tax revenues generated by new or proposed facilities under current assessment and taxation practices. The discussion of these tax revenues has been separated from the discussion of different units of government because of the uncertainty as to how the revenues will be distributed among different units of government.

There are three types of taxable property associated with lignite development: mineral assessments of the plants and mines and pipelines and transmission lines. Only the first two types of taxable property will be considered in this Report. The third type of taxable property will not be considered because of the lack of information about the extent and location of pipelines and transmission lines.

Tax Revenues from Mineral Assessments

County officials have been estimating the mineral value of land actually being mined at $1,500 to $1,600 per quarter-section (160 acres). This value is in addition to the value of the land for farming. In Chapter IV we had estimated that an additional 1,030 acres per year would be stripped to support the new lignite development. For illustrative purposes we have assumed that local property tax levies of 129.75 mills would be applied against the additional taxable value.[135] The taxable value in this case is 50 percent of the assessed value or the 1,030 acres, or $4,800. The expected annual property tax revenue would be $630 (Table 6.26). It would be distributed under the current law as follows: $316 to the school districts ($251 to the Beulah school district and $65 to the Stanton school district in which the mines are located), $136 to the County, $68 to the unorganized townships, $4 to the State, and $106 to all school districts($20 to rural, $36 to Beulah, $35 to Hazen, and $15 to Stanton) under the county equalization program.

Tax Revenues from Plants

The current assessment and taxation practices vary for each of the three facilities. The Basin Electric plant would be subject to a 2 percent gross receipts tax in lieu of the

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[134] This section is based on Kube *et al.*, "Extensive Utilization of Lignite in the West River Diversion Area," and a memo on coal gasification tax prepared by the North Dakota Tax Department in April 1974.

[135] Total mill levies for properties in the noncity portion of Mercer County's Beulah school district for 1973: Beulah School District (65.11), County government (27.75), County equalization (21.89), township government (14.00), and State (1.00).

TABLE 6.25 Estimated Mid 1980's Stanton School District Budget under Rural Concentration Assumption

	Receipts				Expenditures			Surplus (Deficit)
Category	Fixed	Variable	Total	Category	Fixed	Variable	Total	
District Property Tax	$ 23,000	$ 41,000	$ 64,000	Elementary	$ 13,000	$ 105,000	$ 118,000	
Other Local Sources	--	16,000	16,000	Secondary	4,000	96,000	100,000	
Co-op Replacement	--	10,000	10,000					
County Equalization	--	22,000	22,000					
State Tuition Apportionment	--	8,000	8,000					
State Foundation Program	--	113,000	113,000					
Personal Property Replacement	--	--	--					
Federal Funds	--	10,000	10,000					
TOTAL	$ 23,000	$ 220,000	$ 243,000		$ 17,000	$ 201,000	$ 218,000	$ 25,000

TABLE 6.26 Potential Annual Tax Revenues Derived from Lignite Utilization and Mining Facilities in Mercer County Under Current Taxation Practices

Type of Government	Mineral[a]	Basin Electric	Montana Dakota	Michigan Wisconsin	Mines	Total	Percent
State	$ --	$130,000	$ 24,000	$ 14,000	$ 2,000	$ 170,000	3.0
County	100	44,000	687,000	420,000	52,000	1,203,000	21.2
Cities	--	17,000	--	--	--	17,000	0.3
School Districts:							
Beulah	300	19,000	1,816,000	1,114,000	129,000	3,078,000	54.5
Hazen	--	17,000	196,000	116,000	15,000	344,000	5.9
Stanton	100	4,000	45,000	26,000	12,000	87,000	1.5
Rural	--	9,000	100,000	60,000	7,000	176,000	3.2
Townships	100	--	350,000	212,000	26,000	588,000	10.4
TOTAL	$600	$240,000	$3,218,000	$1,962,000	$243,000	$5,663,000	100.0
Percent	(.0)	(4.2)	(56.8)	(34.6)	(4.4)	(100.0)	

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a. The receipts in this column were ignored in summing the total receipts, because they were insignificant compared to the other receipts.

property tax, the Montana-Dakota Utilities are assessed on a unitary basis and are subject to the *ad valorem* property tax, and the Michigan-Wisconsin gasification plant is subject to the regular county assessment and taxation practices.

Basin Electric. In 1965, the North Dakota State Legislature exempted electrical generating cooperatives from *ad valorem* property taxes and subjected them to a two percent tax rate on the market value of the electrical energy sold. This action considerably reduced the taxes the cooperatives would have paid if they had been subject to the general property tax. The law also specified how the receipts should be allocated among the various public sector institutions.[136] State government is the prime beneficiary of the law, because it receives more than 50 percent of the gross receipts tax.

The gross receipts tax from the new Basin Electric plant would be based on its name plate rating (440MW), the saleable electricity (about 83 percent), and the average price per kilowatt-hour ($0.0044045) received by Basin in the most recent two-year period. With the exception of the first two years of operation, the two percent gross receipts tax would generate annual revenue of approximately $240,000 (Table 6.27).

Montana-Dakota Utilities. Investor-owned utilities are assessed on a unitary basis by the State Tax Department and are subject to *ad valorem* property tax. A unitary assessment means that the total utility would be assessed as a unit, including such items as transmission lines. All major plant equipment is subject to tax, which is not the case for gasification facilities.

Although not enough information is available to assess the MDU plant, we have estimated the potential revenue from the plant exclusive of transmission lines. The capital investment for both MDU units is estimated to be $330 million. The assessed value would be $49 million, and the taxable valuation would be $24.8 million.[137] The annual local property taxes, assuming a mill levy of 129.75, would be approximately $3.2 million.

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[136] 1) During the first two years of operation, all of the tax revenue shall be allocated to the county in which the plant is and/or the transmission lines are located. The tax rate is one percent of gross receipts during the first two years of operation, and two percent thereafter.
2) After the first two years of operation, the first $50,000 of annual revenue goes to County government; the second $50,000 goes 50 percent to County governments, and 50 percent to the State; all annual revenue in excess of $100,000 goes 25 percent to the County and 75 percent to the State.
3) Apart from the tax on transmission lines, 15 percent of all revenues received by a county are allocated to incorporated cities and villages in the county according to their population size; 40 percent of all revenues are allocated to the County general fund; and 45 percent of all revenues are apportioned to the County's school district on the basis of average daily attendance.

[137] The assessed value is based on an assessed book value ratio of 20 percent and a depreciation allowance of 25 percent. The taxable value is 50 percent of the assessed value. Kube et al., *op cit.*

TABLE 6.27 Distribution of Gross Receipts Tax From the New Basin Electric 440-MW Plant

Government	First $50,000	Second $50,000	Above $100,000	Total	Percentage
State	$	$25,000	$105,000	$130,000	54.2
County	20,000	10,000	14,000	44,000	18.3
Cities	7,500	3,800	5,300	16,600	6.9
School Districts [a]	22,500	11,200	15,700	49,400	20.6
TOTAL	$50,000	$50,000	$140,000	$240,000	100.0

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a. The receipts are divided among the school districts on the estimated average daily attendence in the mid-1980's (Table 5.15). The receipts are divided as follows: 18% to rural; 39% to Beulah; 35% to Hazen; and 8% to Stanton.

Under current state law concerning the distribution of property tax revenues, $1.8 million would go to the non-city portion of Mercer County's Beulah school district where the plant is located, $687,000 to the County, $350,000 to the unorganized townships, $24,000 to the State, and $561,000 to all school districts ($100,000 to rural, $220,000 to Beulah, $196,000 to Hazen, and $45,000 to Stanton) under the county equalization program.

Michigan-Wisconsin Pipe Line. Coal gasification companies are assessed by the County and are subject to the *ad valorem* property tax on the land and permanent buildings. Plant machinery and equipment are not subject to property taxes under the current law.[138] Exclusion of equipment gives the minimum rather than maximum potential taxable base.

Although there are different estimates of the capital value subject to the property tax, we have estimated the potential property tax revenue from the plant exclusive of the water and gas pipelines. The estimated capital investment is $504 million, of which $151 million would be subject to the property tax.[139] The assessed value would be $30 million, and the taxable value would be $15 million. The annual local property taxes, assuming a mill levy of 129.75, would be approximately $1,962,000.

Under current State law, $985,000 would go to the non-city portion of Mercer County's Beulah school district where the plant is located, $420,000 to the County, $212,000 to the unorganized townships, $14,000 to the State, and $331,000 to all the school districts ($60,000 to rural, $129,000 to Beulah, $116,000 to Hazen, and $26,000 to Stanton), under the county equalization program.

Tax Revenues from Coal Mines

Coal mining companies are assessed by the County and are subject to *ad valorem* property tax on the land and permanent buildings. Mine machinery and equipment are not subject to property tax under the current law. Exclusion of equipment gives the minimum rather than maximum potential taxable base.

Although there are only uncertain estimates of the capital investment in the three coal mines and different estimates of how much of the capital investment is subject to the property tax, we have estimated the potential property tax revenue from those mines. The estimated capital investment is $125 million,[140] of which $18.8 million would be subject to the property tax.[141] The assessed value would be $3.8 million, and the taxable value would be $1.8 million. The annual local property taxes, assuming a mill levy of 129.75, would be approximately $243,000.

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[138] Whether or not such equipment is taxable as real property for coal gasification plants is currently being adjudicated in the courts.

[139] Kube, *et al.*, indicate that the capital investment subject to the property tax is 30 percent of the total capital investment. A memo on coal gasification tax prepared by the North Dakota Tax Department indicates that the capital investment subject to the property tax is ten percent of the total capital investment. We have chosen the higher estimate for our analysis because it appears to be more realistic.

Under current State law, the revenue would go the non-city portion of Mercer County's Beulah and Stanton school districts. It would be distributed as follows: $113,000 to the Beulah school district and $9,000 to the Stanton school district because of the mine locations; $52,000 to the County; $26,000 to the unorganized townships; $2,000 to the State; and $39,000 to all school districts ($7,000 to rural, $16,000 to Beulah, $15,000 to Hazen, and $3,000 to Stanton) under the county equalization program.

Total Tax Revenues

Under current taxation practices, lignite utilization and mining facilities could yield almost $5.7 million annually in tax revenues (Table 6.27). MDU and Michigan-Wisconsin are the two major contributing sources. The Basin Electric plant, with half as large a capital investment as MDU, contributes only 15 percent as much tax revenue because it is taxed under the gross receipts tax rather than under the *ad valorem* property tax.

Mercer County and the Beulah school district are the primary beneficiaries of development under the current tax structure. Even the unorganized townships would received a significant increase over their FY 1973 receipts of $88,000. However, the distribution of beneficiaries would change significantly if the State applied the gross receipts tax in lieu of the *ad valorem* property tax. The total tax receipts would decrease and would be distributed in a manner similar to that in Table 6.27, where the State and all school districts are the primary beneficiaries. The cities do not gain appreciably from either form of taxation.

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[140] The estimated capital investment in the North American coal mine is $100 million (Michigan-Wisconsin, "Coal and Water for Future Gasification," 1973); the estimated capital investment in the Knife River coal mine is $16 million to supply one plant (Bismarck Tribune, July 22, 1974); and the estimated capital investment in the Consolidated coal mine is $9 million (Bismarck Tribune, July 22, 1974).

[141] A memo on coal gasification prepared by the North Dakota Tax Department indicates that the capital investment subject to the property tax is 15 percent of the total capital investment.

CHAPTER VII

Construction Population

In addition to the facilities required to service the permanent employees of the proposed developments, considerable facilities will also be required by the construction workers who will build the projects. This chapter first estimates the number of construction employees that can be expected and then the investment that will be required to provide the necessary facilities in both the private and public sectors.

Employment, Population and Housing Impacts

Employment

Table 7.1 presents a schedule of the number of construction employees for the final phase of the Basin Electric Plant and for the two additional developments proposed in Mercer County. The following analysis will deal only with the construction force associated with the two proposed developments there whereas the previous analysis of the impact of the permanent operating force included all three developments. We have assumed that MDU would begin construction of the first plant in the summer of 1975 and the second in the summer of 1977 and that Michigan Wisconsin would begin construction of the gasification plant in the summer of 1976.

The total construction force consists of both the plant force and those associated with building permanent housing and other facilities for the permanent population (Table 7.2). The housing construction force is estimated to peak at 630 workers in the second half of 1977. (This schedule is probably optimistic given the current and forseeable conditions in the housing construction market.) The total construction force is estimated to peak at 4,600 workers in the first half of 1978.

Population

The construction work force would result in an increase in temporary population due to service employment generated, as well as the dependents of construction and service employees. However, the increase in the number of service employees and dependents in Mercer County would be limited by the fact that many of the construction workers already live in the County or would live outside the County. The service employees and dependents associated with these construction workers would impact counties other than Mercer. (For example, construction workers now employed in Mercer County reside 50 miles away in

TABLE 7.1 Construction Employment for Plants and Mines to be Built in Mercer County

Months	Year	Michigan-Wisconsin	Montana Dakota Utilities	Basin Electric	Total
0	1975		0	231	231
6	1975		66	0	66
12	1976		132		132
18	1976	0	188		188
24	1977	1300	231		1,531
30	1977	2480	431		2,911
36	1978	3435	632		4,067
42	1978	2585	721		3,306
48	1979	330	819		1,149
54	1979	0	930		930
60	1980		816		816
66	1980		540		540
72	1981		588		588
78	1981		565		565
84	1982		316		316
90	1982		0		0

Source: Tables 4.6, 4.7 and 4.8.

Table 7.2 Total New Construction Employment from Plants, Mines and Houses in Mercer County

Month	Year	Plant and Mine Construction Force a	Total Housing Work Force b	Phasing Factor c	Housing Construction Force	Total Construction Force
0	1975	-	-	-	-	-
6	1975	66	1,400	.15	210	276
12	1976	132	1,400	.25	350	482
18	1976	188	1,400	.30	420	608
24	1977	1,531	1,400	.35	490	2,021
30	1977	2,911	1,400	.45	630	3,541
36	1978	4,067	1,400	.40	560	4,627
42	1978	3,306	1,400	.10	140	3,446
48	1979	1,149				1,149
54	1979	930				930
60	1980	816				816
66	1980	540				540
72	1981	588				588
78	1981	565				565
84	1982	316				316
90	1982	0				0

a. From Table 7.1

b. Assumes that the value of housing units in the county would be $42 million. The value does not take into account the housing value associated with lot preparation and assumes that most of the rural housing would be constructed on a part-time basis. The value of construction per employee, $30,000, is based on data from the total value of construction in 1972 (1973 Statistical Abstract of the U.S.) and the total construction employees.

c. Booz Allen & Hamilton, Inc., "Procedures Manual," Chapter VIII. The phasing factor distributes the total residential work force over a 2-year period.

Mandan.) For purposes of this analysis only two-thirds of the construction workers are estimated to locate in Mercer County; the remainder would commute from neighboring counties.[142]

The population impact expected during the construction period is tremendous (Table 7.3). The 13,300 construction population expected in the 36-month period equals the projected long-range total county population, which assumes that 80 percent of the permanent employees would live in the County. The peak construction population is slightly less than double the total increase in permanent population.

Housing

Approximately 4,000 housing units would be needed at the peak period (Table 7.4). We have assumed that approximately 1,800 permanent housing units would be built in time to satisfy part of the housing need. Of the remaining 2,200 temporary housing units, 300 would be "single" quarters and 1,900 units would be mobile homes.

The cost of this temporary housing would, of course, depend upon the kind of housing provided. The most common solution to this need is to construct temporary mobile home communities near the construction site. Such communities can be assembled and dissembled relatively easily. Locating them near the construction site minimizes their impact upon the environment in the host community.

Temporary mobile home sites can be constructed with utilities, water, and sewage facilities provided. We estimate that it would cost approximately $3,000 to provide a complete pad.[143] (The construction force is assumed to bring its own mobile homes.) This would lead to a maximum investment in temporary housing sites of approximately $5.7 million.

Location of Housing

Allocation of construction housing between the population centers and the rural area is extremely difficult. The permanent housing available for construction workers would be located in those communities in which the permanent workers would live as indicated by the gravity model. The temporary housing for construction workers could be near the plant site, on the outskirts of the three cities, or scattered about the rural area. The availability of housing and the effectiveness of local and county zoning ordinances will have a major

[142] The split is based on the location of construction workers who built the Safeguard missile site in Cavalier and Pembia Counties, North Dakota. One-third of the work force lived outside the counties and most of those people were native North Dakota residents. Personal communications with Edsel Boe, Area Extension Agent, North Dakota State University, August 1974.

[143] See Chapter V on private expenditures for housing.

TABLE 7.3 Total New Population Associated With the Construction Work Force in Mercer County

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Months From Start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Basic Construction Force[a]	0	185	323	407	1354	2372	3100	2308	770	623	547	362	394	378	212	0
Population/ 100 Basic Employees[b]	0	304.5	340.0	357.5	387.5	422.5	430.0	442.5	442.5	442.5	442.5	442.5	442.5	442.5	442.5	442.5
Total Population	0	563	1098	1455	5247	10021	13330	10213	3407	2756	2420	1602	1743	1672	938	0

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[a] It is two-thirds of the total construction force.

[b] From Booz Allen and Hamilton, Inc., "Procedures Manual," Chapter VIII, Exhibit VI. It is based on the characteristics of the labor force currently completing the Navajo Generating Station in Page, Arizona. Assumes a stable ratio after forty-two months.

TABLE 7.4 Housing Required for Construction Work Force in Mercer County

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Months From Start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Basic Employees	0	185	323	407	1354	2372	3100	2308	770	623	547	362	394	378	212	0
Single[a]	0	37	48	61	203	237	155	69	23	19	16	11	12	11	6	0
Married Without Dependents[a]	0	28	32	41	68	119	155	69	23	19	16	11	12	11	6	0
Married With Dependents[a]	0	120	242	305	1083	2016	2790	2170	724	586	514	340	370	355	199	0
Service Employees[a]	0	22	48	81	338	712	930	692	231	187	164	108	118	113	64	0
"Single Housing" Demand[b]	0	55	80	102	271	356	310	138	46	38	32	22	24	22	12	0
"Married Housing" Demand[c]	0	142	290	386	1421	2728	3720	2862	955	773	678	448	488	468	263	0
Total Housing Demand	0	197	370	488	1692	3084	4030	3000	1001	811	710	470	512	490	275	0
Total Housing Available[d]	0	0	212	531	850	1163	1830	1713	1051	366	274	228	228	160	69	0

TABLE 7.4 Housing Required for Construction Work Force in Mercer County (con't.)

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Months From Start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
"Single Housing" Required[e]	0	55	80	0	271	356	310	138	0	38	32	22	24	22	12	0
"Married Housing" Required[e]	0	142	78	0	426	1065	1890	1149	0	352	404	220	260	308	194	0
Total Temporary Housing Required	0	197	158	0	697	1421	2200	1287	0	395	436	240	284	330	206	0

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a Booz Allen & Hamilton, Inc., Chapter VIII, Exhibit VI
b Single and Married without Dependents
c Married with Dependents and Service Employees
d Appendix G
e Demand Minus Available. Available Units First Allocated to Married Demand.

influence on the locational pattern. For the purposes of analysis, we have assumed that the "single housing" would be mobile homes near the plants (rural area) and that the "married housing" would be mobile homes near the population centers (Tables 7.5 & 7.6). The distribution among the three population centers would be roughly comparable to the distribution of permanent workers.

Distribution of Total Construction Population

Tables 7.7 and 7.8 present data on the spatial distribution of the construction population. The population distribution is based on the distribution of housing units in Tables 7.5 and 7.6. "Single housing" adds only one population increment for each housing unit and, "married housing" adds 3.25 population increments for each unit.[144] The peak construction population estimated for the mid-1980's, and the percentages they represent of permanent population estimated for the mid-1980's, are estimated to be:

Beulah: Under UCA, 6,400 or 130%
Under RCA, 4,700 or 120%

Hazen: Under UCA, 5,500 or 130%
Under RCA, 4,000 or 115%

Stanton: Under UCA, 500 or 62%
Under RCA, 400 or 55%

Public Sector Costs and Revenues

The construction period, 1975-1982, will be a short period of intense demand upon the public sector. The demand will rise from a near zero population level in 1975 to a peak population level in 1978 of 13,300. Similarly, the demand will fall rapidly from the peak population to a zero population in 1983. Provision of public services for this rapidly changing population level is difficult not only because of the intensity of population change but also because the construction population will be twice as large as the additional permanent population. Even if all the facilities needed by the permanent population were provided early in the construction period they would not be adequate for the construction population.

County and city governments and school districts will probably respond to the increased demand in two ways. They will expand the use of existing facilities (schools can

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[144] Booz, Allen & Hamilton, "Procedures Manual," Chapter VIII, Exhibit VI.

TABLE 7.5 Permanent and Temporary Housing Available to Construction Workers Under Urban Concentration Assumption

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Months From Start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Permanent Housing	0	0	212	531	850	1163	1830	1713	1051	366	274	228	228	160	69	0
Rural	0	0	11	27	43	58	91	86	53	18	14	11	11	8	3	0
Beulah	0	0	104	260	417	570	897	839	515	179	134	112	112	78	34	0
Hazen	0	0	89	223	357	488	769	719	441	154	115	96	96	67	29	0
Stanton	0	0	8	21	34	47	73	69	42	15	11	9	9	6	3	0
Temporary Housing	0	197	158	0	697	1421	2200	1287	0	395	436	240	284	330	206	0
Rural	0	62	84	0	292	409	404	195	0	57	52	33	37	37	22	0
Beulah	0	69	38	0	209	522	926	563	0	174	198	107	128	152	95	0
Hazen	0	60	33	0	179	447	794	483	0	149	170	91	109	129	81	0
Stanton	0	6	3	0	17	43	76	46	0	15	16	9	10	12	8	0

Source: Table 7.4

TABLE 7.6 Permanent and Temporary Housing Available to Construction Workers Under Rural Concentration Assumption

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Months From Start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Permanent Housing	0	0	212	531	850	1163	1830	1713	1051	366	274	228	228	160	69	0
Rural	0	0	64	159	255	349	549	514	315	110	82	68	68	48	21	0
Beulah	0	0	76	196	305	419	659	617	378	132	99	82	82	58	25	0
Hazen	0	0	66	165	264	361	567	531	326	113	85	71	71	50	21	0
Stanton	0	0	6	16	26	35	55	51	32	12	8	7	7	5	2	0
Temporary Housing	0	197	158	0	697	1421	2200	1287	0	395	436	240	284	330	206	0
Rural	0	98	103	0	399	675	877	483	0	195	153	88	102	114	70	0
Beulah	0	51	29	0	153	384	680	413	0	128	146	78	93	112	70	0
Hazen	0	44	24	0	132	330	586	356	0	111	125	68	81	95	60	0
Stanton	0	4	2	0	13	32	57	34	0	12	12	7	8	9	6	0

Source: Table 7.4

TABLE 7.7 Distribution by Year and Area of Construction Population Under Urban Concentration Assumption

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Months From Start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Rural	0	80	133	95	496	745	958	639	186	164	151	100	108	103	58	0
Beulah	0	245	497	910	219	3822	6381	4908	1802	1229	1162	770	840	802	452	0
Hazen	0	210	427	781	1877	3272	5471	4208	1543	1059	998	658	718	687	386	0
Stanton	0	21	39	74	179	315	522	403	147	102	94	64	67	63	39	0
Total	0	556	1096	1860	4744	8154	13332	10158	3678	2554	2405	1592	1733	1655	935	0

Source: Tables 7.4 and 7.5 and 1 population increment for each "single housing" unit and 3.25 population increments for each "married housing" unit.

TABLE 7.8 Distribution by Year and Area of Construction Population Under Rural Concentration Assumption

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Months from Start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
		55	80	0	271	356	310	138	0	38	32	72	24	22	12	0
Rural	0	206	385	557	1611	2694	4216	3145	1103	794	743	491	535	512	289	0
Beulah	0	179	367	668	1606	2810	4686	3608	1323	904	858	564	613	592	333	0
Hazen	0	154	315	577	1386	2418	4036	3105	1141	777	736	487	532	508	284	0
Stanton	0	14	28	56	137	235	392	298	112	81	70	49	53	49	28	0
Total	0	553	1095	1858	4740	8157	13330	10156	3679	2556	2407	1591	1733	1661	934	0

Source: Table 7.4 and 7.6 and 1 population increment for each "single housing" unit and 3.25 population increments for each "married housing" unit.

be run on double shifts, classrooms can be set up in church or cômmunity halls) and retain temporary personnel. Also, they will probably allow overcrowding, congestion and reduction of service levels. The actual mix of actions will significantly influence the costs incurred by units of government. At this time there is no information about how they will respond to the situation. Not only is the anticipated response of local government unknown, but also the actual location of the construction population estimated in a previous section of this chapter is based on tenuous assumptions. If either 50 percent or 90 percent of the construction population locates in Mercer County rather than 67 percent, the estimated population would be very different. Or if the construction population congregates in one town or an independent construction town, then the estimated population location within the County would be incorrect. Thus, the impact of the construction population upon public services should be seen as indicative of problems rather than as dollar measures of deficits and surpluses.

Given the numerous uncertainties, the added costs and revenues are generalized in two ways. First, the estimates are made for city and county expenditures and receipts as a whole rather than the detailed breakdown of the mid-1980's budget. Included in each of these as operating costs are the need to lease or purchase temporary facilities, such as classrooms. Second, construction phase expenditures and revenues are aggregated for the entire period of approximately eight years. Difficulties of determining construction start dates, phasing of construction, and residential locations do not warrant attempting to estimate annual costs. The number of persons, school children, etc. at each 6-month point are added together for all 16 intervals and divided by 2, to obtain the cumulative annual population level between 1975-1982.

County Government

Costs. County expenditures are more directly related to the number of people than city expenditures, and less lag is experienced in providing services. For this analysis, therefore, added costs during the construction phase are projected at 90 percent of the per capita expenditure projected for the permanent population.[145] In addition, we have assumed that County expenditures are limited to O&M expenditures; capital expenditures are attributed to the permanent population because these expenditures are based on serving the permanent population.

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[145] Booz, Allen & Hamilton Inc., "Procedures Manual," Chapter VIII, Formula No. 137.

The annual per capita County expenditure in the mid-1980's is estimated to be $51;[146] 90 percent of that estimate is $46 per capita. The cumulative construction population/years is projected to be 27,200 between 1975-1982. The added County expenditures during the 90-month construction period are $1.3 million (Table 7.9).

Revenues. County revenues are projected on the basis of changes in the taxable value of property and per capita receipts. The taxable value is projected for two different assumptions (Table 7.10). Either the construction population would live in a mix of permanent and temporary housing, 58 percent and 42 percent respectively, or in all temporary housing. The type of housing is important because it determines the cumulative taxable value for the period. Table 7.9 presents the data on the cumulative total receipts for the County under the two assumptions.[147]

As an example of how we estimated the total receipts, consider the permanent/temporary housing assumption. The cumulative taxable value under that assumption is estimated to be $16.1 million.[148] Assuming that the aggregate mill levy remains at 19.25, the County receipts for the 90-month period are estimated to be $309,000. The personal property replacement is one-seventh of the increase in taxable receipts, or $44,000. The remainder of the general services receipts are determined on a per capita basis; $16 for revenue sharing and $3 for miscellaneous receipts. These receipts would total $517,000. County road and bridge receipts combine the revenues for county roads and local county roads. County road receipts would include real property tax of $112,000 resulting from a seven mill levy on the $16.1 million cumulative taxable value, and the personal property replacement of $16,000. Township road receipts would include real property tax of $13,000 resulting from a 14 mill levy on $890,000 cumulative taxable value and the personal property replacement of $2,000. The total County road and bridge receipts for both types of roads are estimated to be $143,000. Additional receipts would include motor vehicle and gas receipts of $322,000.[149] The library receipts would include real property tax of $32,000 resulting from a 2 mill levy on the $16.1 million cumulative taxable value and personal property replacement of $5,000. The cumulative total receipts from all sources are estimated to be $1.4 million.

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[146] From Table 6.5. It includes the $40 per capita cost for general services, the $8 per capita cost for maintenance of county roads and $3 per capita for library services.

[147] The total taxable value for the County is the same under the UCA and RCA.

[148] The taxable value is ten percent of the market value.

[149] See Appendix H.

Table 7.9 Additional Receipts and Expenditures Generated by Construction Population in Mercer County

Category	Receipts	Category	Expenditures	Surplus or (Deficit)[a]
58% Permanent/42% Temporary Housing				
Real Property	$ 309,000	General Services	$ 979,000	
Personal Property Replacement	44,000			
Other	517,000			
SUBTOTAL	870,000	SUBTOTAL	979,000	($109,000)
County Roads and Bridges	143,000	County and Local Roads	190,000	
Motor Vehicle and Gas Tax	322,000			
SUBTOTAL	465,000	SUBTOTAL	190,000	$275,000
Library	37,000	Library	82,000	
SUBTOTAL	37,000		82,000	($45,000)
TOTAL	$1,372,000	TOTAL	$1,251,000	$121,000
100% Temporary Housing				
		General Services	$ 979,000	
Real Property	$ 85,000			
Personal Property Replacement	12,000			
Other	517,000			
SUBTOTAL	614,000	SUBTOTAL	979,000	($365,000)
County Roads and Bridges	40,000	County and Local Roads	190,000	
Motor Vehicle and Gas Tax	322,000			
SUBTOTAL	362,000	SUBTOTAL	190,000	$172,000
Library	10,000	Library	82,000	
SUBTOTAL	10,000	SUBTOTAL	82,000	($72,000)
TOTAL	$986,000		$1,251,000	($265,000)

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a. 90 percent of the estimated expenditure.

TABLE 7.10

CHANGE IN HOUSING VALUES ATTRIBUTABLE TO CONSTRUCTION POPULATION IN MERCER COUNTY[a]

	UCA [b]		RCA [c]	
	Permanent/Temporary (in millions of dollars)	Temporary	Permanent/Temporary (in millions of dollars)	Temporary
Rural	$ 8.9	$ 3.0	$ 48.8	$ 13.9
Beulah	78.3	21.0	57.5	15.6
Hazen	67.0	18.2	49.5	13.4
Stanton	6.5	1.8	4.8	1.3
TOTAL	$ 160.7	$ 44.3	$ 160.6	$ 44.2

a. The data for these calculations are taken from Tables 6.6 and 6.7. The permanent/temporary split is 58/42 in all cities under both UCA and RCA. It is 41/59 in rural under UCA and 54/46 in rural under RCA.

The permanent housing is 95 percent single family units and 5 percent multi-family units. The values of the units taken from Chapter V are $33,500 for a single-family unit and $18,000 for a multi-family unit. As an example of a calculation, consider the cumulative yearly average number of housing units, 2,117, occupied in Beulah. Single family units numbering 2,011 would have market value of $67.4 million, and multi-family units numbering 106 would have a market value of $1.9 million, giving a cumulative total market value of permanent housing of $69.3 million.

The temporary housing is the mobile homes construction workers bring to the area. The value of each unit is based on North Dakota Mobile Homes Tax Law. A trailer of average quality, 60 square feet in area, and 5 years old would have a depreciated value of $5,800. As an example of a calculation, consider the cumulative yearly average number of mobile homes, 1,549, located in Beulah. These units would have a market value of $9.0 million. Adding this value with the value of permanent housing would give the total in the table, $78.3 million.

b. Urban Concentration Assumption

c. Rural Concentration Assumption

Revenues Versus Costs. The cumulative impact on County government finances cannot be estimated with a high degree of predictability. Under the mixed permanent/temporary housing assumption, there could be a cumulative $120,000 budget surplus. Under the all temporary housing assumption, there could be a cumulative $265,000 budget deficit. The actual impact would more likely be a potential deficit because the permanent housing would not be available for the construction population. A potential deficit would also occur if Federal revenue sharing were not available or if the County were forced to increase its road maintenance expenditures in the absence of an accelerated road construction program, which would minimize maintenance expenditures. In this situation there would be a significant reduction in the needed services in order to keep expenditures in line with available receipts.

Under all assumptions, we would like to reiterate that the cost and revenue estimates in 1972-73 dollars are probably too high. The County would not maintain even 90 percent of the per capita level of expenditures during the construction boom nor would the County capture all of its potential receipts.

City Governments

The impact of the construction period on city services will be intense and uneven. Providing police, fire, street, park, and recreation services will tend to lag behind need and to be overutilized. Traffic, water, and sewage disposal costs will rise rapidly due to overcrowding and use of temporary facilities. Pressures on the planning, engineering, and building inspection services will be heavy. For purposes of this analysis we have assumed that city expenditures would fall to 80 percent of the per capita level projected for the permanent population.[150]

City revenues for the construction period will be projected on the basis changes in property values and per capita receipts. Property taxes paid to the city will lag behind the construction of housing or commercial facilities because of the time required to assess property, place it on the tax rolls, and collect taxes. Operating revenues to the city other than property taxes will be projected on a per capita basis. Here again, revenues will lag because of the need to take censuses of population and certify results to the State for subventions.

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[150] Booz, Allen & Hamilton, "Procedures Manual," Chapter VIII, Formula No. 136.

Table 7.11 Additional Receipts and Expenditures Generated by Construction Population in Beulah

Urban Concentration Assumption (Cumulative Population: 13,000)

	58% Permanent / 42% Temporary Housing			100% Temporary Housing		
Category	Receipts	Expenditures[a]	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Real Property	$ 367,000	$		$ 100,000	$	
Personal Property Replacement	52,000			14,000		
Other General	442,000			442,000		
Utility	380,000			169,000		
Park District	82,000			22,000		
All Services		961,000			910,000	
TOTAL	$ 1,323,000	$ 961,000	$362,000	$ 747,000	$ 910,000	($ 163,000)

Rural Concentration Assumption (Cumulative Population: 9,600)

	58% Permanent / 42% Temporary Housing			100% Temporary Housing		
Category	Receipts	Expenditures[a]	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Real Property	$ 270,000	$		$ 73,000	$	
Personal Property Replacement	39,000			10,000		
Other General	326,000			326,000		
Utility	280,000			125,000		
Park District	59,000			16,000		
All Services		793,000			682,000	
TOTAL	$ 974,000	$ 793,000	$ 181,000	$ 550,000	$ 682,000	($ 132,000)

[a] 80% of the estimated expenditures

Beulah

Costs and revenues are calculated under four assumptions. The construction population is predicted under UCA or RCA and either finds some permanent housing or no permanent housing. In the former case, 58 percent of the construction population would live in permanent housing and 42 percent in temporary mobile home parks,[151] and in the latter case, 100 percent of the construction force would live in temporary mobile home parks.

Costs. The estimated mid-1980's per capita cost is $90 for the UCA and $91 for the RCA population living in permanent housing and $70 for the UCA and $71 for the RCA population living in temporary housing.[152] The total added City expenditures during the 90-month period under the four assumptions are estimated to range between $682,000 and $961,000 (Table 7.11).

Revenues. The City revenues are projected on the basis of changes in the taxable value of property and population. As an example of how we estimated the total receipts, consider the permanent/temporary housing-UCA assumption. The cumulative taxable value for Beulah is, in this case, estimated to be $7.83 million (Table 7.10).[153] Assuming that the aggregate mill levy remains at 46.9, the City receipts for the 90-month period are estimated to be $367,000 (Table 7.11). The personal property replacement is one-seventh of the increase in taxable receipts or $52,000. The remainder of the general services receipts are based on the change in population and are estimated to be $442,000.[154] The utility services' receipts are based on the change in population and are estimated to be $380,000–$309,000[155] for the population living in permanent housing and $71,000[156] for the population living in temporary housing. Assuming that the levy for parks remains at nine mills, the park district receipts for the 90-month period are estimated to be $70,000. In addition, the park district would receive $12,000 in personal property replacement, giving total park district receipts of $82,000. The cumulative total receipts given the permanent/temporary housing-UCA assumption are estimated to be $1.3 million. The cumulative total receipts under all four assumptions are estimated to range from $550,000 to $1.3 million.

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[151] The split between the two types of housing is taken from Tables 7.5 and 7.6.

[152] See Tables 6.9 and 6.10 and Appendix I.

[153] Taxable value is ten percent of market value.

[154] $34 per capita based on the mid-1980's budget under UCA, Table 6.9.

[155] $41 per capita based on the mid-1980's budget under UCA, Table 6.9.

[156] $13 per capita based on the mid-1980's budget under UCA, Table 6.9.

Revenues versus Costs. The actual impact of the construction population on Beulah City finances cannot be estimated with a high degree of predictability. Under the two permanent/temporary housing assumptions, the construction population would create a budget surplus. Under the two all temporary housing assumptions, the population would create a budget deficit. The impact would more likely be a deficit because the permanent housing would not be available for the construction population. In any case, the actual cost and revenue estimates are probably too high. The City probably would not maintain even 80 percent of the 1980's per capita level of expenditures during the construction boom, nor would the City capture all the receipts, such as revenue sharing.

Hazen

The costs and revenues are calculated under the same four assumptions given for Beulah.

Costs. The estimated mid-1980's per capita cost is $83 for the UCA and $86 for the RCA population living in permanent housing and $66 for the UCA and $68 for the RCA population living in temporary housing.[157] The total added City expenditures during the 90-month period under the four assumptions are estimated to range between $592,000 and $849,000 (Table 7.12).

Revenues. The city revenues are projected on the basis of changes in the taxable value of property and per capita receipts.[158] As an example of how we estimated the total receipts, consider the permanent/temporary housing-UCA assumption. The cumulative taxable value for Hazen in this case is estimated to be $6.7 million (Table 7.10). Assuming that the aggregate mill levy remains at 54.7, the City receipts for the 90-month period are estimated to be $366,000. The personal property replacement is one-seventh of the increase in taxable receipts or $52,000. The remainder of the general service receipts are based on the change in population and are estimated to be $374,000.[159] The utility services' receipts are based on the change in population and are estimated to be $309,000–$253,000 for the population living in permanent housing[160] and $56,000 for the population living in temporary housing.[161] Assuming that the levy for parks remains at nine mills, the park district receipts for the 90-month period are estimated to be $60,000. In addition, the park

[157] See Tables 6.12 and 6.13 and Appendix I.

[158] $38 per capita based on the mid-1980's budget under UCA Table 6.12.

[159] $34 per capita based on the mid-1980's budget under UCA, Table 6.12.

[160] $39 per capita based on the mid-1980's budget under UCA, Table 6.12.

Table 7.12 Additional Receipts and Expenditures Generated by Construction Population in Hazen

Urban Concentration Assumption (Cumulative Population: 11,200)

	58% Permanent / 42% Temporary Housing		Surplus (Deficit	100% Temporary Housing		Surplus (Deficit)
Category	Receipts	Expenditures	a	Receipts	Expenditures	
Real Property	$ 366,000	$		$ 99,000	$	
Personal Property Replacement	52,000			14,000		
Other General	374,000			374,000		
Utility	309,000			146,000		
Park District	69,000			19,000		
All Services		849,000			739,000	
TOTAL	$ 1,170,000	$ 849,000	$321,000	$ 652,000	$739,000	($ 87,000)

Rural Concentration Assumption (Cumulative Population: 8,700)

Category	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Real Property	$ 271,000	$		$ 74,000	$	
Personal Property Replacement	39,000			11,000		
Other General	296,000			296,000		
Utility	254,000			113,000		
Park District	51,000			14,000		
All Services		682,000			592,000	
TOTAL	$ 911,000	$ 682,000	$229,000	$ 508,000	$ 592,000	($ 84,000)

[a] 80% of the estimated expenditure .

district would receive $9,000 in personal property replacement, giving total park district receipts of $69,000. The cumulative total receipts given the permanent/temporary housing-UCA assumption are estimated to be $1.2 million. The cumulative receipts under all four assumptions are estimated to range from $508,000 to $1.2 million.

Revenues Versus Costs. The actual impact of the construction population on Hazen finances cannot be estimated with a high degree of predictability. Under the two permanent/temporary housing assumptions, the construction population would create a budget surplus. Under the two temporary housing assumptions, the population would create a budget deficit. The actual impact would more likely be a budget deficit because the permanent housing would not be available for the construction population. In any case, the actual cost and revenue estimates are probably too high. The City probably would not maintain even 80 percent of the 1980's per capita level of expenditures during the construction boom nor would the City capture all the receipts, such as revenue sharing.

Stanton

The cost and revenues are calculated under the same four assumptions given for Beulah.

Costs. The estimated mid-1980's percapita cost is $89 for the UCA and $97 for the RCA population living in permanent housing and $43 for the UCA and $46 for the RCA population living in temporary housing.[162] The total added City expenditures during the 90-month period under the four assumptions are estimated to range between $37,000 and $77,000 (Table 7.13).

Revenues. The city revenues are projected on the basis of changes in taxable value of property and per capita receipts for Stanton under all four assumptions. As an example of how we estimated the total receipts, consider the permanent/temporary housing-UCA assumption. The cumulative taxable value for Stanton in this case is estimated to be $650,000 (Table 7.10). Assuming that the aggregate mill levy remains at 55.7, the city receipts for the 90-month period are estimated to be $36,000. The personal property replacement is one-seventh of the increase in taxable receipts or $5,000. The remainder of the general receipts are estimated on the change in population and are estimated to be $35,000.[163] The utility services' receipts are based on the change in population and are

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[161] $12 per capita based on the mid-1980's budget under UCA, Table 6.12.

[162] See Tables 6.15 and 6.16 and Appendix I.

[163] $32 per capita based on the mid-1980's budget under UCA, Table 6.15.

Table 7.13 Additional Receipts and Expenditures Generated by the Construction Population in Stanton

Urban Concentration Assumption (Cumulative Population: 1,100)

	58% Permanent / 42% Temporary Housing			100% Temporary Housing		
Category	Receipts	Expenditures[a]	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Real Property	$36,000	$		$10,000	$	
Personal Property Replacement	5,000			1,000		
Other General	35,000			35,000		
Utility	28,000			7,000		
Park District	5,000			1,000		
All Services		77,000			47,000	
TOTAL	$109,000	$77,000	$32,000	$54,000	$47,000	$ 7,000

Rural Concentration Assumption (Cumulative Population: 800)

Category	Receipts	Expenditures[a]	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Real Property	$27,000	$		$ 7,000	$	
Personal Property Replacement	4,000			1,000		
Other General	26,000			26,000		
Utility	21,000			5,000		
Park District	4,000			1,000		
All Services		60,000			37,000	
TOTAL	$82,000	$60,000	$22,000	$40,000	$37,000	$ 3,000

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[a] 80% of the estimated expenditure

estimated to be $28,000–$25,000 for the population living in permanent housing[164] and $3,000 for the population living in temporary housing.[165] Assuming that the levy for parks remains as seven mills, the park district receipts for the 90-month period are estimated to be $4,000. In addition, the park district would receive $700 in personal property replacement, giving total park district receipts of $5,000. The cumulative total receipts given the permanent/temporary housing-UCA assumption are estimated to be $109,000. The cumulative total receipts under all assumptions are estimated to range between $40,000 and $109,000.

Revenues versus Costs. The actual impact of the construction population on Stanton City finances can be estimated with more predictability than in the cases of Beulah and Hazen. Under all four assumptions, there would be small budget surpluses as a result of the construction population.[166] Apparently, the City budget would be balanced under most circumstances. In any case, the actual cost and revenue estimates are probably too high. The City probably would not maintain even 80 percent of the 1980's per capita level of expenditures during the construction boom, nor would the City capture all the receipts such as revenue sharing.

Schools

Probably the most dramatic demand for community services will be for temporary educational facilities. While the permanent work force population will add approximately 1,900 ADM to the school district enrollment, the construction force population will add approximately 5,022 ADM at its peak point.

The analysis of the impact of the additional enrollment during the construction period is simplified in two ways. First, the analysis is limited to the impacts on the three significant school districts in the County. We cannot predict with sufficient accuracy the number of children who would enroll in rural school districts. Second, school district costs and revenues are aggregated for the 90-month period. Difficulties of determining the population cycle do not warrant attempting to estimate annual costs and revenues.

Beulah

The cumulative school enrollment is based on the number of married housing units or families in Beulah (Tables 7.5 and 7.6) and the number of students per family unit from the

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[164] $40 per capita based on the mid-1980's budget under UCA, Table 6.15.

[165] $9 per capita based on the mid-1980's budget under UCA, Table 6.15.

[166] The construction boom population is only 60 percent of the permanent population in Stanton, while it is 120 percent of the permanent populations in Beulah and Hazen.

"Procedures Manual."[167] The cumulative number of year-round occupied housing units is estimated to be 3,666 under UCA. The number of students associated with these family units is estimated to be 3,700 enrolled in K-8 and 1,250 enrolled in 9-12. The cumulative number of year-round occupied housing units is estimated to be 2,693 under the RCA. The number of students associated with these family units is estimated to be 2,720 enrolled in K-8 and 916 enrolled in 9-12.

Costs. The annual variable costs are based on the FY 1973 expenditures. The variable cost per K-8 ADM was $683 and the cost per 9-12 ADM was $957. The cumulative total for the 90-month period is estimated to be $2.5 million for K-8 and $1.2 million for 9-12, or a total of $3.7 million for the UCA population (Table 7.14). The cumulative total for the 90-month period under the RCA is estimated to be $1.8 million for K-8 and $877,000 for 9-12, or a total of $2.7 million.

The annual fixed costs are difficult to estimate because we do not know how the school district will respond to the increased enrollment. It will certainly utilize the existing excess capacity for 102 ADM. It could house the other students in the Beulah community center and churches, could run the school on double shifts, or could accelerate its building expansion program which would permit the temporary students to utilize the space planned for the permanent population. As an outside estimate of costs, we have assumed that the district would provide additional space for the yearly average enrollment, minus the surplus capacity of 120 ADM, by using mobile home units. Using the same area per permanent pupil and a cost for mobile home units of $12 per square foot, the total investment required for temporary units would be as follows:

	UCA		RCA	
	Number of Students[168]	Cumulative Total Costs[169]	Number of Students[168]	Cumulative Total Costs[169]
Elementary	373	$380,000	250	$255,000
Secondary	126	189,000	85	127,000
TOTAL	499	$569,000	335	$382,000

We have made no attempt to calculate a fixed cost for the peak enrollment in the fall of 1978 of 2,400 ADM under the UCA and 1,754 ADM under the RCA. We assume that the district would use other community facilities or double shifts.

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[167] Booz, Allen & Hamilton Inc., Chapter VIII, Exhibit VI.

[168] Annual average number of students between 1975-1982.

[169] The total cost is based on 85 square feet for K-8 and 125 square feet for 9-12, at $12 per square foot.

Table 7.14 Cumulative Total
Beulah School District Budget for Construction Population School Enrollment under Four Conditions

	58% Permanent / 42% Temporary Housing			100% Temporary Housing		
Category	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Urban Concentration Assumption						
Variable Costs[a]	$	$3,723,000		$	$ 3,723,000	
Property Tax	366,000			100,000		
County Equalization	148,000			414,000		
State Payments	2,633,000			2,550,000		
Federal Payments	94,000			94,000		
Fixed Costs		569,000			569,000	
Property Tax	156,000			43,000		
TOTAL	$3,397,000	$4,292,000	($ 895,000)	$2,828,000	$ 4,292,000	($ 1,464,000)
Rural Concentration Assumption						
Variable Costs[a]	$	$ 2,735,000		$	$ 2,735,000	
Property Tax	269,000			73,000		
County Equalization	112,000			31,000		
State Payments	1,922,000			2,081,000		
Federal Payments	69,000			69,000		
Fixed Costs		382,000			382,000	
Property Tax	115,000			31,000		
TOTAL	$ 2,487,000	$ 3,117,000	($630,000)	$ 2,285,000	$ 3,117,000	($ 832,000)

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[a] Other receipts (other local sources and co-op replacement) are not listed, because they would not vary with the increased school enrollment or change in value of the housing stock.

Revenues. Local, County, State, and Federal receipts will be available to offset the increased expenditures. The cumulative receipts for the 90-month period will vary given the four assumptions about population concentration and housing availability. As an example of how we calculated the receipts under any one assumption, consider the permanent/ temporary housing-UCA assumption. An increase in cumulative taxable value of $7.83 million and a 46.8 mill levy would create $366,000 in real property tax available as variable receipts.[170] The Beulah school district's share of the County equalization funds would be $148,000.[171] The FY 1973 State tuition apportionment ($30/child) and State foundation ($497/K-8 and $713/9-12 for education and $31/ADM for transportation) programs would provide $149,000 in apportionment receipts and $2.5 million in foundation receipts, or a total of $2.6 million. The Federal Government grants $19/ADM, which would generate receipts of $94,000. The same taxable value listed above and a 20 mill levy would generate $156,000 in real property tax receipts available for fixed expenditures. The cumulative total receipts for the 90-month construction period are estimated to be $3.4 million. Receipts under all four assumptions are calculated in a similar fashion and are estimated to range from $2.3 million to $3.4 million.

Revenues Versus Costs. As we would have anticipated, the Beulah school district would operate with a deficit under all assumptions during the 90-month construction period. Even if the district does not encounter any additional fixed costs and uses its receipts for fixed expenditures to offset variable expenditures, it would still have a cumulative budget deficit for the period. The budget deficit would be more severe under both temporary housing assumptions because of the lower taxable value of mobile homes. In all cases, the actual estimates of receipts and expenditures are probably too high. In particular the school district would not maintain the per ADM level of expenditure because it legally cannot operate at a deficit.

Hazen

The cumulative school enrollment is based on the number of married housing units or families in Hazen (Tables 7.5 and 7.6) and the number of students per unit from the "Procedures Manual."[172] The cumulative number of year-round occupied housing units is estimated to be 3,141 under the UCA. The number of students associated with these family units is estimated to be 3,172 enrolled in K-8 and 1,068 enrolled in 9-12. The cumulative number of year-round occupied housing units is estimated to be 2,319 under the RCA. The number of students associated with these family units is estimated to be 2,342 enrolled in K-8 and 788 enrolled in 9-12.

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[170] See Table 7.10 for the taxable value.

[171] See Appendix J for the basis of this estimate.

[172] Booz, Allen & Hamilton Inc., Chapter VIII, Exhibit VI.

Costs. The annual variable costs are based on the FY 1973 expenditures. The variable cost per K-8 ADM was $515 and the cost per 9-12 ADM was $1,017. The cumulative total for the 90 month period under UCA is estimated to be $1.6 million for K-8 and $1.1 million for 9-12 or a total of $2.7 million (Table 7.15). The cumulative total for the 90 month period under RCA is estimated to be $1.2 million for K-8 and $808,000 for 9-12 or a total of $2.0 million.

The annual fixed costs are difficult to estimate for the same reasons mentioned in the discussion about the Beulah school district. As an outside estimate of costs, we have assumed that the district would provide additional space for the yearly average enrollment, minus the surplus capacity of 140 ADM, by using mobile home units. Using the same area per permanent pupil and a cost for mobile home units of $12 per square foot, the total investment required for temporary units would be as follows:

	UCA		RCA	
	Number of Students[173]	Cumulative Total Costs[174]	Number of Students[173]	Cumulative Total Costs[174]
K-8	292	$298,000	188	$192,000
9-12	99	148,000	63	94,000
TOTAL	391	$446,000	251	$286,000

We have made no attempt to calculate a fixed cost for the peak enrollment which is limited to the fall of 1978, of 2,110 ADM under UCA and 1,557 ADM under RCA. We assume that the district would use other community facilities or double shifts.

Revenues. Local, County, State and, Federal receipts will be available to offset the increased expenditures. The cumulative receipts will vary given the four assumptions about population concentration and housing availability. As an example of how we calculated the receipts under any one assumption, consider the permanent/temporary housing-UCA

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[173] Annual average number of students between 1975-1982.

[174] The total cost is based on 85 square feet for K-8 and 125 square feet for 9-12, at $12 per square foot.

Table 7.15 Cumulative Total
Hazen School District Budget for Construction Population School Enrollment Under Four Conditions

Urban Concentration Assumption

	58% Permanent / 42% Temporary Housing			100% Temporary Housing		
Category	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Variable Costs[a]	$	$2,720,000		$	$2,720,000	
Property Tax	335,000			91,000		
County Equalization	128,000			35,000		
State Payments	2,083,000			2,269,000		
Federal Payments	187,000			187,000		
Fixed Costs		446,000			446,000	
Property Tax	134,000			36,000		
TOTAL	$2,867,000	$3,166,000	($ 299,000)	$2,618,000	$3,166,000	($ 548,000)

Rural Concentration Assumption

	58% Permanent / 42% Temporary Housing			100% Temporary Housing		
Category	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Variable Costs[a]	$	$2,008,000		$	$2,008,000	
Property Tax	248,000			67,000		
County Equalization	94,000			26,000		
State Payments	1,534,000			1,674,000		
Federal Payments	138,000			138,000		
Fixed Costs		286,000			286,000	
Property Tax	99,000			27,000		
TOTAL	$2,113,000	$2,294,000	($ 181,000)	$1,932,000	$2,294,000	($ 362,000)

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[a] Other receipts (other local sources and co-op replacement) are not listed, because they would not vary with the increased school enrollment or change in value of the housing stock.

assumption. An increase in the cumulative taxable value of $6.70 million and a 50 mill levy would create $335,000 in real property tax available as variable receipts.[175] The Hazen school district's share of the County equalization fund would be $128,000.[176] The FY 1973 State tuition apportionment ($30/child) and State foundation ($475/K-8, $713/9-12, and $31/ADM) programs would generate $127,000 in apportionment receipts and $956,000 in foundation receipts, or a total of $2.1 million. The Federal Government grants $44 per ADM, which would generate receipts of $187,000. The same taxable value listed above and a 20 mill levy would generate $134,000 in real property tax receipts available for fixed expenditures. The cumulative total receipts for the 90-month construction period are estimated to be $2.9 million. Receipts under all four assumptions are calculated in a similar fashion and are estimated to range from $1.9 million to $2.9 million.

Revenues Versus Costs. As we would have anticipated, the Hazen school district would operate with a deficit under all assumptions during the 90-month construction period. If the district does not encounter any additional fixed costs and uses its receipts for fixed expenditures to offset variable expenditures, it would have sufficient revenues under the permanent/temporary housing assumptions, but would have insufficient revenues under the all temporary housing assumptions. The budget deficit would be more severe under both temporary housing assumptions because of the lower taxable value of mobile homes. In all cases, the actual estimates of receipts and expenditures are probably too high. In particular, the school district would not maintain the per ADM level of expenditure because it legally cannot operate at a deficit.

Stanton

The cumulative school enrollment is based on the number of "married" housing units or families in Stanton (Tables 7.5 and 7.6) and the number of students per family unit from the "Procedures Manual."[177] The cumulative number of year-round occupied housing units under UCA is estimated to be 303. The number of students associated with these family units is estimated to be $306 enrolled in K-8 and 103 enrolled in 9-12. The cumulative number of year-round occupied housing units under RCA is estimated to be 226. The number of students associated with these family units is estimated to be 228 enrolled in K-8 and 77 enrolled in 9-12.

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[175] See Table 7.10 for the taxable value.

[176] See Appendix J for the basis of this estimate.

[177] Booz, Allen & Hamilton Inc., "Procedures Manual," Chapter VIII, Exhibit VI.

Costs. The annual variable costs are based on FY 1973 expenditures. The variable cost per K-8 ADM was $538 and the cost per 9-12 ADM was $1,238. The cumulative total for the 90-month period under UCA is estimated to be $165,000 for K-8 and $128,000 for 9-12, or a total of $293,000 (Table 7.16). The cumulative total for the 90-month period under RCA is estimated to be $123,000 for K-8 and $95,000 for 9-12, or a total or $218,000.

The annual fixed costs are not so difficult to estimate for the Stanton school district as for the Beulah and Hazen school districts because the excess capacity in the Stanton school district, 98 ADM, exceeds the yearly average enrollment under UCA of 38 in K-8 and 13 in 9-12, and under RCA of 19 in K-8 and 7 in 9-12. We have made no attempt to calculate a fixed cost for the peak enrollment, which is limited to the fall of 1978, of 201 ADM under UCA and 151 ADM under RCA.

Revenues. Local, County, State and Federal receipts will be available to offset the increased expenditures. The cumulative receipts will vary given the four assumptions about population concentration and housing availability. As an example of how we calculated the receipts under any one assumption, consider the permanent/temporary housing-UCA assumption. An increase in the cumulative taxable of $650,000 and a 54.7 mill levy would create $36,000 in real property tax available as variable receipts.[178] The Stanton's school district's share of the County equalization fund would be $14,000. The FY 1973 State tuition apportionment ($30/child) and State foundation ($475/K-8, $756/9-12, and $31/ADM) programs would generate $13,000 in apportionment receipts and $194,000 in foundation receipts, or a total of $207,000. The Federal Government grants $36 per ADM, which would generate receipts of $15,000. The same taxable value listed above and a 20 mill levy would generate $13,000 in real property tax receipts for fixed expenditures. The cumulative total receipts for the 90-month construction period are estimated to be $285,000. Receipts under all four assumptions are calculated in a similar fashion and are estimated to range from $192,000 to $285,000.

Revenues Versus Costs. As we would have anticipated, the Stanton school district would operate with a deficit under all assumptions during the 90-month construction period. Even if the district does not bear any additional fixed costs and used its receipts for

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[178] See Table 7.10 for the taxable value.

Table 7.16 Stanton School District Budget for Construction Population School Enrollment Under Four Conditions

Category	58% Permanent / 42% Temporary Housing			100% Temporary Housing		
	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Urban Concentration Assumption						
Variable Costs[a]	$	$ 293,000		$	$ 293,000	
Property Tax	36,000			10,000		
County Equalization	14,000			4,000		
State Payments	207,000			226,000		
Federal Payments	15,000			15,000		
Fixed Costs						
Property Tax	13,000			4,000		
TOTAL	$ 285,000	$ 293,000	($ 8,000)	$ 259,000	$ 293,000	($ 34,000)
Rural Concentration Assumption						
Variable Costs[a]	$	$ 218,000		$	$ 218,000	
Property Tax	26,000			7,000		
County Equalization	10,000			3,000		
State Payments	154,000			168,000		
Federal Payments	11,000			11,000		
Fixed Costs						
Property Tax	10,000			3,000		
TOTAL	$ 211,000	$ 218,000	($ 7,000)	$ 192,000	$ 218,000	($ 26,000)

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[a] Other receipts (other local sources and co-op replacement) are not listed, because they would not vary with the increased shcool enrollment or change in value of the housing stock.

fixed expenditures to offset variable expenditures, it would still have a cumulative budget deficit for the period. The budget deficit would be more severe under both temporary housing assumptions because of the lower taxable value of mobile homes. In all cases, the actual estimates of receipts and expenditures are probably too high. In particular, the school district would not maintain the per ADM level of expenditure because it legally cannot operate at a deficit.

CHAPTER VIII

Summary and Conclusions

Summary

Introduction

Extensive coal development in Mercer County, North Dakota, will result in significant changes in the economic structure and population distribution in the County and will place new demands on the public and private sectors. We have conducted an extensive investigation of the anticipated changes in the previous chapters. This chapter is a set of summary reviews and conclusions derived therefrom.

Boom Town Experiences

While construction booms are often disruptive of public sector services, they do not have to be if there is proper planning and timely financial assistance. The experiences in Gillette and Rock Springs provide sufficient evidence that a boom can be disruptive of educational, health, police and water and sewer services. The experience in Langdon suggests that public services can be maintained with a minimum of inconvenience. The Safeguard project supported advanced planning and insured the timely availability of financial support for capital investments. The public sector has the potential to manage a construction boom if it has the ability to plan for capital facilities, to control the physical location of residential activity and to secure financial resources.

Mercer County

Mercer County encompasses an area of approximately 1,100 square miles in western North Dakota. The present economy remains based on agriculture, even though its share of total County employment has declined from 50 percent to 33 percent and the total number of farmers declined by 35 percent between 1950 and 1970. Total employment during the same period decreased from 2,800 to 2,100, or by only 25 percent. The County population in 1973 was estimated to be 6,200 which is a decline of over 2,500 since 1950. The population of the six cities in the County ranges from 100 to 1,300.

The units of local government, county and city, and school districts provide a full range of services to their constituents. In many cases, such as schools, hospitals and recreation services, there is excess capacity to handle a modest increase in population.

Coal Development

Three lignite utilizing facilities are either under construction or proposed for construction in Mercer County. Basin Electric is scheduled to complete a coal electrification plant with a generating capacity of 440 MW in 1975. MDU proposes to start construction on the first of two 440 MW units in 1975. Michigan Wisconsin Pipe Line proposes to start construction on a 250 million cubic feet coal gasification plant in 1976. The two coal electrification plants will more than triple the generating capacity of existing facilities in the County and the coal gasification plant will be the first such facility in the County.

Employment Population and Private Sector Impacts

The projected coal developments are estimated to increase total permanent employment in the mid-1980's by approximately 3,500 jobs or by a 167 percent increase over the 1970 employment level. The developments will create approximately 1,400 export jobs, and the new export employment will stimulate approximately 2,100 jobs in the service sector.

On the basis of the best data available, we have estimated that approximately 2,800 workers (80 percent of the total work force) would live in the County and 700 would live outside the County. In turn, we estimated that of the workers residing in the County between 70 and 95 percent would live in the population centers (Beulah, Hazen and Stanton) and the remainder would live in the rural area.

The County's permanent population is estimated to increase from the 1973 level of 6,200 to 13,300 by the mid-1980's as a result of the new developments (Table 8.1). The spatial distribution of the population increase depends upon what percentage of the new workers and their families live in the population centers and in the rural area. The cities of Beulah and Hazen will probably triple in population size. The city of Stanton and the rural area will be less noticeably affected by new residents.

The County's school enrollment is estimated to increase from 1,500 in FY 1973 to 3,400 in the mid-1980's. Again the greatest increase will occur in the Beulah and Hazen School Districts.

The number of new housing units constructed in the County is estimated to be 2,300. The split among various types of housing units is assumed to be 68 percent (1600) single family, 5 percent (100) multifamily and 27 percent (600) mobile homes. The costs of constructing this number of housing units are estimated to be $62 million.

TABLE 8.1 Current and Projected Population Distributed Among the Population Centers and the Rural Area

	1970 Population	1980 Lignite Development Population		1980 Total Population	
		UCA[a]	PCA[b]	UCA[a]	RCA[b]
Rural	3,075	354	2,151	3,428	5,225
Beulah	1,344	3,494	2,607	4,838	3,951
Hazen	1,240	3,039	2,204	4,279	3,444
Stanton	517	286	211	803	728
	6,175	7,173	7,173	13,348	13,348

a Urban Concentration Assumption

b Rural Concentration Assumption

Source: Table 5.9

The new workers are estimated to increase the total income generated in the County by $33 million over $24 million in 1972. Of this new income, $18.2 million will be spent on retail sales in the County; the remainder is primarily used for paying Federal and State taxes, purchasing housing and savings.

The retail sector is estimated to invest approximately $4.4 million in new retail facilities to serve the new population.

Public Sector Impacts of Permanent Population

The total permanent population residing in Mercer County will have a fiscal impact on all major units of government. The estimated impacts are the total annual receipts and expenditures of those units of government in the mid-1980's. The results of the fiscal impact analysis should be seen as indicators of potential trouble areas (budget deficits) rather than exact estimates of mid-1980's conditions. The results are not exact because we do not know the precise number of workers who will choose to live in the County, or where they will live in the County. Nor do we know precisely how the units of government will respond to the new population. The constant dollar costs of providing services could change dramatically if these units of government vary the quality of services or choose not to provide some services. In addition, the actual costs would change, due to the rate of inflation between 1973 and the mid-1980's.

The net fiscal impact on the *State* is estimated to change from a FY 1972 surplus condition attributable to Mercer County to a mid-1980's condition which could range from a $50,000 surplus to a $453,000 deficit (Table 8.2).[179] The primary determinant of the fiscal condition is the timing of State investment in highways. If the State accelerates its rate of highway modification in order to complete the estimated improvements in five years, then there will be an annual deficit attributable to Mercer County. If the State maintains its current rate of highway construction and completes the estimated improvements in ten years, then there will be annual surplus attributable to Mercer County. The other contributing factor to the deficit condition is the State supplemental payments to school districts. However, that deficit is a function of the greatly increased State payment per pupil as well as the increase in school enrollment associated with the new population.

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[179] The total State budget is assumed to be balanced or in a surplus condition as in FY 1973-1975.

TABLE 8.2 Summary of Fiscal Impacts on Units of Government Resulting From the Permanent Population

($000)

	Receipts	Expenditures	Surplus or (Deficit)
STATE			
General Fund	$2,694	$2,796	
Special Fund	2,984	2,832 - 3,335	
	$5,678	$5,628 - 6,131	$50 or ($453)
COUNTY			
General Activities	$ 657	$ 537	
Roads	545	407 - 1,327	
Library	35	37	
Hospital	--	--	
	$1,237	$ 981 - 1,901	$256 or ($664)

CITY	UCA[a]			RCA[b]		
BEULAH	Receipts	Expenditures	Surplus or (Deficit)	Receipts	Expenditures	Surplus or (Deficit)
General Services	$ 391	$ 323		$ 329	$ 270	
Utility Services	198	182		164	150	
Park District	42	39		35	32	
	$ 631	$ 544	$87	$ 528	$ 452	$76
HAZEN	UCA[a]			RCA[b]		
	Receipts	Expenditures	Surplus or (Deficit)	Receipts	Expenditures	Surplus or (Deficit)
General	$ 362	$ 264		$ 291	$ 215	
Utility Services	165	139		135	117	
Park District	38	39		29	32	
	$ 565	$ 442	$123	$ 455	$ 364	$91

Table 8.2 Summary of Fiscal Impacts on Units of Government Resulting From the Permanent Population (con't.)

STANTON	UCA[a]			RCA[b]		
	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
General Services	$ 57	$ 38		$ 51	$ 35	
Utility Services	34	51		30	49	
Park District	3	2		3	1	
	$ 94	$ 91	$3	$ 84	$ 85	($1)

SCHOOL DISTRICTS

BEULAH	UCA[a]			RCA[b]		
	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Fixed	$ 106	$ 205		$ 92	$ 153	
Variable	1,083	1,085		903	910	
	$1,189	$1,290	($101)	$ 995	$1,063	($68)

HAZEN	UCA[a]			RCA[b]		
	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Fixed	$ 88	$ 150		$ 68	$ 116	
Variable	963	857		802	716	
	$1,051	$1,007	$44	$ 870	$ 832	$38

STANTON	UCA[a]			RCA[b]		
	Receipts	Expenditures	Surplus (Deficit)	Receipts	Expenditures	Surplus (Deficit)
Fixed	$ 26	$ 17		$ 23	$ 17	
Variable	235	216		220	201	
	$ 261	$ 233	$28	$ 243	$ 218	$25

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a Urban Concentration Assumption

b Rural Concentration Assumption

Source: Various tables, Chapter VI

The net fiscal impact on *Mercer County* government is estimated to change from a FY 1972 surplus condition to a mid-1980's condition which could range from a $256,000 surplus to a $664,000 deficit. The determinant of the annual fiscal condition is the number and distribution of permanent population which settles in the rural area and the timing of the County investment in County and township roads. If the new population scatters throughout the County, and the County government aims to complete a road network to meet its need, then there will be an annual deficit. If the new population concentrates in the population centers, or if the County maintains the current ratio between construction and maintenance expenditures, then there will be an annual surplus. We have estimated that general funds activities would generate an annual surplus, but that the surplus of $130,000 would be a deficit without Federal revenue sharing. Library activities would create an annual deficit of $2,000 unless the library system receives the anticipated Federal grants or Federal revenue sharing monies given to the County.

The net fiscal impacts on *city governments* (Beulah, Hazen and Stanton) in the mid-1980's are estimated to be similar to the FY 1973 surplus conditions.[180] The revenue mechanisms, allowing for some lag in collection, are adequate to finance the new required services. The only exception is the deficit in utility services operation for Stanton. Unless the City receives a Farmers Home Administration grant to build its new water system or increases its user fees considerably, it would have to operate the system at a deficit with the RCA population. For all cities we have assumed that they would receive revenue sharing funds and Environmental Protection Agency grants for water pollution control facilities. However, the revenue sharing funds would not be as essential to the cities as they would be to the County for maintaining their budget surpluses because the budget surpluses are greater than the amounts received in revenue sharing.

The fiscal condition of the *school districts* of Beulah, Hazen and Stanton in the 1980's are estimated to be as varied as they were in FY 1973. In FY 1973, the Beulah school district operated with a surplus, the Hazen school district operated with a deficit and the Stanton school district operated with a surplus. In the mid-1980's we have estimated that the Beulah school district would operate with a deficit whereas the Hazen and Stanton school districts would operate with surpluses. The significant increase in State supplemental payments per pupil between FY 1973 and FY 1975 would permit the latter two school districts to cover the increase in operating costs. In all cases, sufficient funds would be available if we included some new receipts resulting from lignite development.

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[180] The only deficit in FY 1973 was for $800 for the Hazen Park District and that deficit was covered by accumulated excess funds.

All of the above units of government combined would receive additional annual revenues of $5.7 million as a result of taxes on new lignite utilization and mining facilities (Table 8.3). Under current taxation practices Mercer County and the Beulah school district would be the prime beneficiaries. However, the amount of monies available and their distribution would change considerably if the State applied a gross receipts tax similar to the one now applied only to rural electric generating cooperatives. Total revenues could decrease by as much as 50 percent and the State and all school districts would be the prime beneficiaries.

Temporary Construction Phase (1975-1982)

Employment, Population and Housing

The construction work force consists of both those building the plants and mines and those associated with building housing and other facilities for the permanent population. The construction work force would be active in the County between 1975 and 1982 and would peak at 4,600 workers in 1978.

The construction work force would result in an increase in temporary population, consisting of service employees and dependents of construction and service employees. Assuming that two-thirds of the construction workers would live in Mercer County, the County would experience a temporary population increase between 1975 and 1982, which would peak at 13,300 people in 1978. The additional number of school age children would peak at 5,000 in 1978.

The temporary population would require a maximum of approximately 4,000 housing units at the peak. We have assumed that approximately 1,800 permanent housing units would be built in time to satisfy part of the temporary housing need. Of the remaining 2,200 housing units, 300 would be "single" quarters and 1,800 would be mobile homes.

Construction or Temporary Phase (1975-1982)

Public Sector Impacts

The public sector impacts during this period are difficult to estimate with much accuracy. County and city governments and school districts could respond to the situation by renting additional space and retaining temporary personnel, which would increase per

TABLE 8.3 Potential Annual Tax Revenues From Lignite Utilization and Mining Facilities in Mercer County Under Current Taxation Practices.

Type of Government	($000) Revenue	Percent
State	$ 170	3.0%
County	1,203	21.2%
Cities	17	0.3%
School Districts		
Beulah	3,087	54.5%
Hazen	335	5.9%
Stanton	87	1.5%
Rural	176	3.2%
Townships	588	10.4%
	$5,663	100.0%

Source: Table 6.27

capita costs. Or they could allow overcrowding, congestion and reduction of service levels, which would decrease per capita costs. Not only is the anticipated response of local governments unknown, the actual number and location of the construction population, which would require additional expenditures, could be 25 percent higher or lower than estimated. We do not have adequate data on the locational preferences of the construction population and availability of housing in particular areas. Thus, the impact of the construction population upon public services particularly should be seen as indicative of problems rather than as dollar measures of deficits and surpluses.

Given the numerous uncertainties, the added costs and revenues are generalized in two ways. First, the estimates are made for city and County expenditures as a whole rather than the detailed breakdown of the mid-1980's budget. Second, construction phase expenditures and revenues are aggregated for the entire period of approximately eight years rather than on an annual basis.

If permanent housing for the construction population is built in the mid-1970's, then the property tax revenue on this housing would result in a cumulative budget surplus for County government (Table 8.4). If the construction population lives only in temporary housing (mobile homes) during the period, then the property tax revenue would be insufficient to cover a cumulative budget deficit. The potential impact would more likely be a cumulative budget deficit because the permanent housing would not be available for the construction population. In this situation the County would probably not provide services in order to keep expenditures in line with available receipts.

If permanent housing for the construction population is built in the mid-1970's, then the property tax revenue on this housing would result in cumulative budget surpluses in all three cities. If the construction population lives only in temporary housing (mobile homes) during the period, then the property tax revenue would be insufficient to cover a cumulative budget deficit except in the case of Stanton. Stanton is estimated to have a budget surplus under all assumptions because the population impact on Stanton is much less than in Beulah or Hazen. The potential impact would more likely be a cumulative budget deficit for cities because the permanent housing would not be available for the construction population. In this situation the cities would probably not provide services in order to keep expenditures in line with available receipts.

The cumulative impact on school district finances can be estimated with more predictability than in the case of county and city governments. Under all assumptions about

TABLE 8.4 Summary of Cumulative Fiscal Impacts on Units of Government Resulting From the Temporary Population

($000)

COUNTY	58% Permanent - 42% Temporary Housing			100% Temporary Housing		
Category	Receipts	Expenditures	Surplus or (Deficit)	Receipts	Expenditures	Surplus or (Deficit)
General Services	$ 870	$ 979		$ 614	$ 979	
Roads	465	190		362	190	
Library	37	82		10	82	
	$1,372	$1,251	$121	$ 986	$1,251	($265)

CITY

BEULAH	58% Permanent - 42% Temporary Housing			100% Temporary Housing		
Assumption	Receipt	Expenditure	Surplus or (Deficit)	Receipt	Expenditure	Surplus or (Deficit)
UCA[a]	$1,322	$ 961	$361	$ 747	$ 910	($163)
RCA[b]	$ 974	$ 793	$181	$ 550	$ 682	($132)

HAZEN	58% Permanent - 42% Temporary Housing			100% Temporary Housing		
Assumption	Receipt	Expenditure	Surplus or (Deficit)	Receipt	Expenditure	Surplus or (Deficit)
UCA	$1,170	$ 849	$321	$ 652	$ 739	($87)
RCA	$ 911	$ 682	$229	$ 508	$ 592	($84)

STANTON	58% Permanent - 42% Temporary Housing			100% Temporary Housing		
Assumption	Receipts	Expenditures	Surplus or (Deficit)	Receipts	Expenditures	Surplus or (Deficit)
UCA	$ 109	$ 77	$32	$ 54	$ 47	$7
RCA	$ 82	$ 60	$22	$ 40	$ 37	$3

Table 8.4 Summary of Cumulative Fiscal Impacts on Units of Government Resulting From the Temporary Population (con't.)

SCHOOL DISTRICTS

BEULAH

Assumption	58% Permanent - 42% Temporary Housing			100% Temporary Housing		
	Receipts	Expenditures	Surplus or (Deficit)	Receipts	Expenditures	Surplus or (Deficit)
UCA	$3,397	$4,292	($895)	$2,828	$4,292	($1,466)
RCA	$2,487	$3,117	($630)	$2,285	$3,117	($832)

HAZEN

Assumption	58% Permanent - 42% Temporary Housing			100% Temporary Housing		
	Receipts	Expenditures	Surplus or (Deficit)	Receipts	Expenditures	Surplus or (Deficit)
UCA	$2,867	$3,166	($299)	$2,618	$3,166	($549)
RCA	$2,113	$2,294	($181)	$1,932	$2,294	($362)

STANTON

Assumption	58% Permanent - 42% Temporary Housing			100% Temporary Housing		
	Receipts	Expenditures	Surplus or (Deficit)	Receipts	Expenditures	Surplus or (Deficit)
UCA	$ 285	$ 293	($8)	$ 259	$ 293	($34)
RCA	$ 211	$ 218	($7)	$ 192	$ 218	($26)

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a Urban Concentration Assumption
b Rural Concentration Assumption
Source: Various tables, Chapter VII

the availability of housing, school districts would operate at a deficit. Even if receipts for fixed expenditures were utilized to cover variable expenditures, budget deficits would occur in Beulah and Stanton. In this situation, they would reduce expenditures per pupil, probably by placing more children in each classroom.

Conclusions

Permanent Population Financial Impact

The 1980's permanent population financial impact would generally be a condition of excess revenues for all units of government. The current financing arrangements, including Federal revenue sharing and excluding receipts derived from taxing new coal developments, would generate, in most cases, revenues sufficient to cover the costs of providing services for the new population. The only exceptions would be the financing of State and County roads, Stanton's water supply system and the Beulah school district. These exceptions could be financed with no difficulty with tax revenues from the new developments. Or, in the case of State and County highways, the rate of investment could be reduced to remain within the limit of available funds, and in the case of the Stanton water supply system, the City might receive a Federal grant for part of the capital cost.

The permanent population would result in a favorable financial impact for several reasons. First, most of the units of government now operate with budget surpluses. The new population would essentially amplify a favorable financial condition. If the units of government had been operating with budget deficits, then the new population would probably intensify an unfavorable financial condition. Second, most of the units of government have surplus physical capacity to absorb some, if not all, of the population growth. The city halls, fire departments and recreation facilities can accommodate sizeable population increases. Third, the predicted costs reflect levels of service, such as the number of fire trucks per 10,000 people, which are based on the historical experience of the region. If the units of government provide levels of service which reflect the problems of much larger units of government or the availability of partial subsidies, then the significant increase in per capita costs may result in unfavorable financial impacts.

Temporary Population Financial Impact

The 1975-1982 temporary population financial impact would generally be a condition of excess costs for all units of government. The most pronounced problem would be for school districts, which would operate at a deficit even under the most optimistic conditions. Since units of government cannot operate with deficit budgets, the excess cost situation would be reflected in a severe curtailment of services in order to balance budgets.

The temporary population would result in an unfavorable financial impact for the obvious reason that the revenue base would be inadequate. The vast majority of the temporary population would live in mobile homes, whose inhabitants pay much less per capita property tax than residents of permanent homes. In addition, there would be a lag in revenue collection from all sources, which means that funds which were available, would not be available in a timely fashion.

Potential New Tax Revenue from Coal Development

The new coal development revenue would be approximately one-half the amount of revenue from all other sources–$5.6 million in new revenue and $10.1-$10.8 million from all other sources (Tables 8.2 and 8.3).

The additional tax revenue would be more than sufficient to meet the costs of the new services for the permanent population not covered by other sources of revenue. The new coal development revenue for all units of government is estimated to be $5.6 million and the new excess cost is estimated to be $1.2 million, which includes the cost of an accelerated State and County highway program and the cost overruns in the City of Stanton and Beulah school district (Table 8.5). However, the annual revenue would have to be redistributed to cover these costs. The State and cities would have to receive more revenues and the school districts and townships less. The Beulah school district in particular would have excess revenues even if it used part of its coal development revenues to cover excess costs.

The additional tax revenue from lignite development would also be sufficient to cover the cumulative deficit resulting from the temporary population. The cumulative deficit of $1.8 million could be covered by the annual receipts for one year. The major difficulty is that the annual receipts would not be available at the time the local units of government need the revenues. The debt would be incurred in the period between 1975-1982 and the annual receipts would not be available until the mid-1980's. In addition, the revenue would have to be redistributed to cover the costs to cities as it would only adequately cover the costs to the County and to the school districts, primarily the Beulah school district.

TABLE 8.5 Annual Excess Costs Associated With the Permanent Population and Cumulative Excess Costs Associated With the Construction Population

	Permanent Population	Temporary Population
State	$ (453)	$ ---
County	(664)	(265)
City[a]	(1)	(233)
School District[a]	(86)	(1,322)
	($1,204)	($1,820)

[a] For the UCA & RCA populations, the deficit is the average deficit for each city or school district summed across all relevant units of government.

Source: Tables 8.2 and 8.4

Total potential revenue would probably not materialize if the present revenue mechanism remains in place. The units of government receiving the incremental lignite revenue would be required to reduce the tax levy applied against all property because they would not need the revenue to cover their costs. In that situation other units of government would not have the monies they need to cover additional costs. At the same time the new developments would receive a considerable net tax break in the absence of State intervention to realign the taxing structure.

Minimizing Financial Impacts

Units of local government could not only draw on new sources of revenues, but could also benefit from policies which minimize financial impact. These policies include availability of housing, concentration of human settlement, and the timing of new developments.

The financial impact of the temporary population would be minimized if permanent single and multifamily housing units were available in the early part of the construction period. The County and city governments, assuming a minimal lag in revenue collection, would operate with an overall cumulative surplus for the construction period if advanced permanent housing were available (Table 8.3). In addition, the cumulative deficit of the school districts would be less under such a condition.

Both the temporary and permanent populations would result in a more favorable financial impact under the UCA rather than under the RCA. The financial impact on County, city and school district governments is less, i.e., greater surpluses or smaller deficits under the UCA compared to the RCA (Tables 8.2 and 8.4). The favorable impact on the County is not obvious from the aggregate data in Table 8.2 unless one recalls the earlier discussion which explained that part of the excess cost for roads would result from a scattering of the population throughout the County. We anticipate that the financial impact of UCA compared to RCA would even be more favorable if data were available which reflected lower costs of school district transportation and police and fire protection.

Although we did not specifically examine the impact of alternative dates for initiating construction, we would anticipate some variation in financial impact under different circumstances. If the construction of the Michigan-Wisconsin Pipe Line and Montana-Dakota Utilities projects were initiated three rather than one year apart, then the construction population would peak at approximately 10,000 rather than 13,000. Reduction of the peak population would reduce the financial strain placed on local units of government.

Institutional Changes

The projected favorable financial impact will result only if the State takes certain actions such as:

- Assisting local units of government in developing their planning and management capacity. While the Lewis and Clark RC&D is providing technical assistance, the County itself would benefit from a planning capability which would provide more detailed projections, secure State and Federal funds, etc. The cities would benefit from programs which would improve their delivery of services and which would assist them in attracting additional personnel;
- Removing the coal developments from the local taxing districts and placing them under a State taxing district. The State could apply either a gross receipts tax similar to the one applied to rural electric cooperatives or a property tax based on the state-wide mill levy. The State could then distribute the revenues based on the net fiscal impact;
- Making capital improvement and operating funds available to local units of government until their share of the coal development receipts is available;
- Either establishing a housing development corporation, which would acquire land and build permanent housing, or requiring the new companies to finance and supervise the acquisition of land and the construction of permanent housing;
- Insisting that the County adopt effective land use controls. Effective land use controls are defined as the adoption of a land development plan which concentrates human settlement and adherence to the plan by County planning commissioners. The pattern of development described by the urban concentration assumption is a partial indication of the beneficial results of effective land use controls;
- Evaluating its own procedures for the location and timing of coal development in the State and attempting to minimize the intensification of construction booms.

APPENDIX A

Capacity Guidelines for Public Facilities

The following guidelines were used to determine 1) the adequacy of existing community facilities and services to meet the needs of the current population, and 2) the requirements for facilities and services to meet the needs of the projected population.

Hospital

The number of hospital beds required per thousand population is 4.52. This estimate is arrived at by taking an admission rate of 1 out of 5 people times 7 days to arrive at total patient days of 400. Total patient days divided by 365 days gives an average daily census of 3.84. The preferred occupancy rate for a hospital is 85 percent rather than 100 percent, so the number of hospital beds required per thousand population is 4.52.

This is the standard applied by the State Department of Health, Division of Health Facilities Planning.

Police Protection

The adequacy of police protection is based on the number of full-time officers in proportion to the population. Police protection requirements for communities up to 10,000 are:

Population	Ratio of Police Officers to Population
Less than 3,000	1 officer for each 865 persons or fraction thereof
3,000-5,000	1 officer for each 800 persons or fraction thereof
5,000-10,000	1 officer for each 770 persons or fraction thereof

This standard is based on a combination of the standard adopted by the Lewis and Clark 1805 RC&D and the ratio of police officers to population within North Dakota and other North Central States adopted by the Safeguard project for the ABM impacted area.

Library

A minimum of two books and a maximum of four per person is the usual standard. The library space required for a 15,000-25,000 population is between 7,500 and 13,000 square feet. Approximately 8,500 square feet would be the minimum space required to serve a population of 18,400, which is approximately the combined 1970 population of McLean and Mercer Counties. Of the total 8,500 square feet, 4,000 square feet are needed for shelving, 3,500 square feet for reader space, and 1,000 square feet for staff space. However, this amount of reader and staff space is not necessary for the combined McLean

Mercer Library building in Riverdale because the population served is not concentrated in Riverdale. The physical space requirements are satisfied by the two branch libraries in Beulah and Hazen.

This standard is based on national library standards adopted by the State of North Dakota Library Commission.

Fire Protection

The adequacy of fire protection facilities is based on the ratio of fire department personnel and equipment to population served. The standard requirements are:

Population	Volunteer Fire Department	
	Men	Engines
0-1,250	20	1
1,250-9,600	40	2

This standard is based on requirements of the National Board of Fire Underwriters adopted by the Safeguard project for the ABM impacted area.

Water Supply System

Projected water supply capacities for each community in Mercer County are based on the 1973 peak daily use of the existing water systems. The peak daily uses are 190 gallons in Beulah, 111 gallons in Golden Valley, and 153 in Hazen; the peak daily use is unknown for Pick City. Stanton and Zap do not have community water supply systems.

This standard is based on a survey conducted by the State Department of Health, Division of Environmental Services.

Sewage Disposal Systems

Expansion of the existing sewage treatment lagoons is based on 1 acre of lagoon for each 100 people.

This standard is essentially the same as the standard adopted by the State Department of Health, Division of Environmental Services.

Parks and Recreation

Cities provide their citizens with open space or park land and recreation facilities. The open space guidelines are:

Population	Open Space Standard[1]
Less than 1,000	1 acre per 40 population
1,000-2,500	1 acre per 50 population
2,500-5,000	1 acre per 60 population

Population Increment	Facilities Required[2]
1,000	½ acre developed playground 1½ acres open field area 2 basketball courts 1½ acres of sport fields/picnic areas
2,000	tennis court
3,000	softball field
5,000	wading pool
6,000	baseball field
10,000	25-yard outdoor pool
20,000	50-yard outdoor pool
25,000	indoor pool golf course football field community center

These guidelines should be used in conjunction with individual recreational interests of the population and adjusted accordingly in order to plan facilities. For example, residents of Mercer County might desire additional indoor facilities because of the long winter, and areas designed for snowmobiles.

We have not discussed guidelines or facilities plans for regional or County-wide parks, given the existence of the large recreation complex associated with the Garrison Reservoir and Lake Sakakawea and the two State game management areas east of the Fort Berthoud Indian Reservation.

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[1] Proposed by the National Recreation Association and adopted by the North Dakota Outdoor Recreation Agency.

[2] Proposed by Intermountain Planners and Wirth-Berger Associations in "Powder River Basin Capital Facilities Study," for Wyoming Communities (April 1974).

APPENDIX B

Employment Multiplier

We have adopted the economic base type of analysis for this report.[3] According to one form of this analysis, all employment within a community may be divided into two categories: that which produces goods and services for firms and individuals outside of Mercer County and that which produces goods and services for firms and individuals within the confines of Mercer County. The first category is called export employment. the second, service employment. Thus, the employees at the coal gasification plant would be export employees, and the employees in retail trade and services would be service employees.

The local economy is considered to be dependent upon export employment. Thus an increase in export employment will stimulate growth in service employment resulting in growth of total economic activity, while a decrease in export employment will force a decrease in service employment, resulting in a decrease in total economic activity. The ratio of total employment (export plus service) to export employment is usually referred to as the total employment multiplier and reflects changes in total employment due to changes in export employment.

The total employment multiplier for Economic Area 96 in 1966 was 2.50 (Table B1).[4] This means that there were 1.5 service jobs for every 1 export job. We have adopted the regional multiplier of 2.50 rather than the Mercer County multiplier of 2.22 because we anticipate that with the new development the economic structure of Mercer County will mature. The new residents will demand a different array of services and will provide a critical mass to support them. However, we have not allowed the multiplier to exceed the regional average because we do not anticipate that any community in Mercer County will become a regional trade center like Bismarck, Dickinson, or Minot. The proximity of these centers to Mercer County and the willingness of shoppers in that area to drive long distances would effectively prevent the development of a new regional center.

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[3] This discussion of the employment multiplier is based on material in Martin J. Westisen and Glen A. Nelson, "Kaiparowits Socio-Economic Study" (Provo, Utah: Center for Business and Economic Research, Brigham Young University, February, 1973).

[4] The total employment multiplier of 2.50 is based on 1966 employment data for Economic Area 96 (Bismarck), which includes 13 counties in Southwestern North Dakota and one county in Montana (Table B1). The total employment multiplier for Economic Area 93 (Minot), which includes 12 counties in Northwestern North Dakota and 4 counties in Northeastern Montana, is 2.40. Mercer County is on the northern tier of counties in Economic Area 93 and thus is adjacent to Economic Area 96.

TABLE B.1 Total Employment for Economic Areas 93 and 96 By Export and Service Categories[a]

	Economic Area #93		Economic Area #96	
Export	28,466		21,227	
Agriculture		17,716		18,082
Forestry		0		0
Mining		1,583		574
Manufacturing		874		723
Railroads		684		228
Utilities		0		0
Wholesale		544		0
Federal Government		1,249		999
State and Local Government		0		342
Armed Forces		5,816		279
Service	39,948		31,741	
TOTAL	68,414		52,968	
MULTIPLIER		2.40		2.50

a. We separated the export and service sectors on the basis of information provided by the Regional Economic Division, Bureau of Economic Analysis, Department of Commerce. The Division advised us that the following categories should be considered export employment:

- All agriculture, forestry, and fisheries
- All mining
- All manufacturing except that portion of food and kindred products and printing and publishing which served the region (economic area). The regional portions are 3 percent and 2 percent, respectively, of total regional employment and are based on those sectors' shares of the national economy in 1966. Any employment in excess of the national average for those sectors is considered export employment.
- Railroad and public utilities employment in excess of that which serves the region. The regional portions are 1 and 2 percent, respectively, of total regional employment and are based on those sectors' shares of the national economy in 1966.
- Wholesale employment in excess of that which serves the region. The regional portion is 18 percent of total regional employment and is based on that sector's share of the national economy in 1966.
- All Federal Government
- State and local government in excess of that which serves the region The regional portion is 5 percent of total regional employment and is based on that sector's share of the national economy in 1966.

All other categories and the regional portion of the above sectors are classified as service employment.

All data for these calculations are from U.S. Water Resources Council, "1972 OBERS Projections", Series "C" Vol. 2, p. 5, 191, & 197.

TABLE C.2 Actual Distribution of Work Force at UPA and Basin Power Plants

	UPA		
Place	Native*	Nonnative	Total
Beulah	5	1	6
Hazen	18	4	22
Stanton	9	3	12
Rural Mercer County	5	2	7
Riverdale	0	2	2
Rural McLean County	0	0	0
Center	0	0	0
Rural Oliver County	1	0	1
	38	12	50

	Basin Plant #1			Plant #2		
Place	Native	Nonnative	Total	Native	Nonnative	Total
Beulah	4	0	4	0	0	0
Hazen	7	9	16	0	4	4
Stanton	8	6	14	0	3	3
Rural Mercer County	6	2	8	0	0	0
Riverdale	0	0	0	0	1	0
Washburn	3	2	5	0	0	1
Rural McLean County	0	0	0	0	0	0
Center	3	0	3	0	0	0
Hanover	0	1	1	0	0	0
Rural Oliver County	5	0	5	0	0	0
	36	20	56	0	9	9

	All Employees		
	Native	Normative	Total
Inside County	62 (83%)	34 (83%)	96(83%)
Outside County	12 (17%)	7(17%)	19(16%)
	74(100%)	41(100%)	115(100%)

*Native is defined as a person who was born in the county in which he is working. A native employee could be an individual who has left the County for some time and has now returned to take a job at the power plant.

Source: Interviews with company employees.

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TABLE C.3 Actual and Estimated Distribution of Power Plant Employee in Mercer County

		Estimated	
	Actual	UCA	RCA
UPA			
Hazen	22	19	14
Stanton	12	19	14
Mercer County	13	2	12
Other	3	10	10
	50	50	50
Basin Plant #1			
Hazen	16	21	16
Stanton	14	21	16
Mercer County	12	3	13
Other	14	11	11
	56	56	56

APPENDIX C

Residential Distribution

The method for estimating the percent of all new employers who will live in a given area is highly judgmental. The principal factors to be considered in assigning population to cities include accessibility from place of work to residence, housing availability, existing infrastructure, availability of shopping, recreational facilities, and other amenities, and attitude and ability of the community to accept the new population.

In order to improve upon a completely subjective distribution of residential activity, we have used a simplified gravity model such as exhibited in Table C1 to distribute workers between cities. The results of the application of the model to each industrial location, plus minor consideration of subjective factors, formed the basis for employee distribution.

As a test of the accuracy of the gravity model, we computed the residential assignment of the present work force at the UPA and Basin power plants with their actual place of residence. Table C2 is the data on the actual distribution, and Table C3 is a comparison of the data on the actual and estimated distribution in Mercer County. The gravity model, with a 60 percent weighting on nonwork trips and RCA, gave a close approximation of the actual distribution of the employees at the Basin plant No. 1. However, the gravity model, with a 60 percent weighting on nonwork trips and both UCA and RCA, underestimated the UPA employees who live in Hazen and overestimated the UPA employees who live outside the County.

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TABLE C.1 Gravity Model For Estimating Worker Choice of Residence Between Two Towns

$$SF_2 = f \frac{\frac{1000}{d} \quad a^2}{\frac{1000}{(d_a)^2} + \frac{1000}{(d_b)^2}} + (1-f) \frac{a}{a + b}$$

Where:

SF_2 = % of workers choosing to live in Town A

f = importance of work trips to family (range from 40% to 50%)

$1-f$ = importance of nonwork trips to family (range from 60% to 50%)

d_a = time-distance in minutes, employment center to Town A (plus 5 minutes terminal time)

d_b = time-distance in minutes, employment center to Town B (plus 5 minutes terminal time)

a = population size of Town A

b = population size of Town B

Example:

Plant to Town

	miles	time	time + 5	$(t+5)^2$	population 1970
Town A Stanton	5	5	10	100	517
Town B Hazen	19	19	24	576	1,240

(we assume that $f = .40$)

Source: Booz Allen & Hamilton, Inc., "Procedures Manual"

APPENDIX D

Total Income Multiplier

The total income multiplier is based on the same economic base concept underlying the total employment multiplier. Total income is separated into export and service income, and the local economy is assumed to be dependent upon export income.

The total income multiplier of 2.5 is based on 1969 income data for Economic Area 96 (Table D1). The total income multiplier for Economic Area 93 is 2.1.

We separated the export and service sector income in the same manner that we separated export and service sector employment. We also added transfer payments to export income and property income to service income. The split between the two categories was based on the national average of 70 percent of the difference between personal income and earnings being property income and 30 percent being transfer payments.

All data for these calculations are from U.S. Water Resources Council 1972 OBERS Projections, Series "E".

Table D1. Total Income for Economic Areas 93 and 96, by Basic and Service Categories

Export	249,646	151,350
Agriculture	120,520	75,214
Forestry	0	0
Mining	10,864	3,992
Manufacturing	5,526	5,434
Railroads	6,116	2,724
Utilities	2,949	4,597
Wholesale	0	8,741
Federal Government	19,576	13,424
State and Local Government	0	7,595
Armed Forces	39,943	3,446
Transfer Payments	35,152	26,183
Service	280,452	224,487
TOTAL	530,098	375,837
TOTAL INCOME MULTIPLIER	2.12	2.48

APPENDIX E North Dakota State Budget[a]

FY 1972
(Millions of $s)

Category	Revenues
General Fund	
Sales & Use Tax[a]	$ 53.9
Personal Income Tax[a]	21.0
Corporate Income Tax[a]	4.0
Cigarette Tax[a]	7.1
Annual Electric Franchise Tax[b]	.09
Motor Vehicle Excise Tax[a]	6.6
Other[a]	20.0
SUBTOTAL	$152.7
Special	
Income from State Lands[c]	$ 3.5
Motor Vehicle Fuel Tax[a]	25.4
Motor Vehicle Registration[a]	14.6
Other[a]	89.5
SUBTOTAL	$133.0
TOTAL	$285.7

Category	Expenditures
General Fund	
State Foundation[d]	$ 25.9
Social Service Bureau[e]	9.9
Personal Property Replacement[d]	21.0
All Other[d]	56.4
SUBTOTAL	$113.2[a]
Special	
State Tuition Program[f]	$ 3.5
Highway (State)[g]	54.0
Highway (County & City)[g]	31.9
Other[d]	74.5
SUBTOTAL	$132.0
TOTAL	$245.2

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a From Thirty-First Biennial Report of the Tax Commissioner, July 1, 1970 - June 30, 1972.
b Tax Department Files. This is the share retained by the State.
c From Fortieth Biennial Report of the Commissioner of the University and School Lands, July 1, 1970 - June 30, 1972.
d North Dakota Budget, Legislative Appropriations, 1971-1973. One-half the expenditure.
e North Dakota, Department of Social Services, Statistics, 1972.
f North Dakota, Department of Public Instruction.
g North Dakota, Highway Statistics, 1973.

APPENDIX F Basis of Estimate For Annual Receipts of Motor Vehicle Registration Fees and Motor Fuel Taxes Received by Mercer County and Cities Located Within Mercer County, Mid-1980's

590,000 - Estimated number of vehicles registered in entire State, 1985

10,050 - Estimated number of vehicles registered in Mercer County, 1985

1.703% - Percentage of total highway taxes available for distribution to all counties and cities in Mercer County.

$56,000,000 X37%	-	Total estimated highway tax receipts for the State
$20,720,000 X1.703%	-	Total highway tax receipts available for all counties and cities in State
$ 353,000 X73%	-	Highway tax receipts available for Mercer County and its cities
$ 258,000	-	Mercer County's share of highway taxes during mid-1980's
$ 353,000 X27%	-	Highway tax receipts available for Mercer County and its cities
$ 95,000	-	Share of highway taxes available for Mercer County cities during mid-1980's

Distribution of Highway Taxes to Cities in Mercer County

Name of City	Estimated Population		Amount of Highway Tax	
	UCA	RCA	UCA	RCA
Beulah	4,830	3,951	$44,000	$43,000
Golden Valley[a]	235	235	2,000	3,000
Hazen	4,279	3,444	39,000	37,000
Pick City[a]	169	119	1,000	1,000
Stanton	803	728	7,000	8,000
Zap[a]	271	271	2,000	3,000
TOTAL	10,537	8,748	$95,000	$95,000

a. 1970 population.

APPENDIX G Construction Housing Available From Permanent Stock

Year	1975	1975	1976	1976	1977	1977	1978	1978	1979	1979	1980	1980	1981	1981	1982	1982
Months from start	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Total [a] Housing Projected	2284	2284	2284	2284	2284	2284	2284	2284	2284	2284	2284	2284	2284	2284	2284	2284
Number[b] Built	0	0	228	571	914	1827	2056	2284	2284	2284	2284	2284	2284	2284	2284	2284
Number Occupied by Permanent Workers [c]	0	0	16	40	64	164	226	511	1233	1918	2010	2056	2056	2124	2215	2284
Units Available[d]	0	0	212	531	850	1663	1830	1713	1051	366	274	228	228	160	69	0

a. Chapter 5. Total housing stock built in the county
b. Booz Allen & Hamilton, Chapter VIII, Exhibit VII
c. Based on Tables 4.6, 4.7 and 4.9 showing arrival of operating workers
d. Units built minus occupied by permanent workers.

APPENDIX H Basis of Estimate for Amount of Motor Vehicle Registration Fees and Motor Fuel Taxes Generated by Construction Population Living Within Mercer County

Fiscal Year	Estimated Number of Construction Workers and Service Employees (Table 7.4)	Ratio of Vehicles Per Worker	Estimated No. of Registered Vehicles Generated by Construction Workers	Amount Distributed to Counties and Cities Per Vehicle (37%)	Total Amount Distributed to County and Cities
1976	289	1.5	434	$ 33.57	$ 14,569
1977	1,091	1.5	1,636	33.86	55,395
1978	3,557	1.5	5,336	34.13	182,118
1979	2,001	1.5	3,001	34.40	103,234
1980	761	1.5	1,141	34.65	39,536
1981	491	1.5	737	34.89	25,714
1982	384	1.5	576	35.12	20,229
					$440,795

$441,000
x73%
$322,000 = Mercer County Share

$441,000
x27%
$119,000 = Cities' Share

Beulah	-	53,000
Golden Valley	-	4,000
Hazen	-	46,000
Pick City	-	3,000
Stanton	-	9,000
Zap	-	4,000
Total		$119,000

APPENDIX I

Per Capita Costs

Beulah

Under the permanent/temporary housing-UCA assumption, the per capita cost is calculated as follows: $67 for general services; $19 for water ($4 for the new annual debt of $12,400 and $15 for O&M); $6 for sewer; $12 for solid waste disposal; and $8 for the park district. Assuming that the City would only be able to maintain 80 percent of this expenditure level, the per capita cost would be 80 percent of $112 or $90.

Under the permanent/temporary housing-RCA assumption, the per capita cost is calculated as follows: $69 for general services; $19 for water ($4 for the new annual debt of $9,700 and $15 for O&M); $6 for sewer; $12 for solid waste disposal; and $8 for the park district. Assuming that the City would only be able to maintain 80 percent of this expenditure level, the per capita cost would be 80 percent of $114 or $91.

Under the all temporary housing-UCA assumption, the per capita cost does not include the cost of city-provided water and sewer services because these services would be provided by operators of mobile home parks. Assuming that the City would only be able to maintain 80 percent of the expenditure level, the per capita cost would be 80 percent of $87 or $70.

Under the all temporary housing-RCA assumption, the per capita cost is lower for the same reason as stated above. The per capita cost would be 80 percent of $89 or $71.

Hazen

Under the permanent/temporary housing-UCA assumption, the per capita cost is calculated as follows: $61 for general services; $16 for water ($6 for the current annual debt of $24,600 and $10 for O&M); $6 for sewer; $12 for solid waste disposal; and $9 for the park district. Assuming that the City would only be able to maintain 80 percent of this expenditure level, the per capita cost would be 80 percent of $104 or $83.

Under the permanent/temporary housing-RCA assumption, the per capita cost is calculated as follows: $63 for general services; $17 for water ($7 for the current annual debt of $24,600 and $10 for O&M); $6 for sewer; $12 for solid waste disposal; and $9 for the park district. Assuming that the City would only be able to maintain 80 percent of this expenditure level, the per capita cost would be 80 percent of $107 or $86.

Under the all temporary housing-UCA assumption, the per capita cost does not include the cost of city-provided water and sewer services because these services would be provided by operators of mobile home parks. Assuming that the City would only be able to maintain 80 percent of the projected expenditure level, the per capita cost would be 80 percent of $82 or $66.

Under the all temporary housing-RCA assumption, the per capita cost is lower for the same reason as stated above. The per capita cost would be 80 percent of $84 or $68.

Stanton

Under the permanent/temporary housing-UCA assumption, the per capita cost is calculated as follows: $46 for general services; $50 for water ($35 for the new annual debt of $28,000 and $15 of O&M); $7 for sewer; $6 for solid waste disposal, and $2 for the park district. Assuming that the City would only be able to maintain 80 percent of this expenditure level, the per capita debt would be 80 percent of $111 or $89.

Under the permanent/temporary housing-RCA assumption, the per capita cost is calculated as follows: $49 for general services; $56 for water ($41 for the new annual debt of $28,000 and $15 for O&M); $8 for sewer; $6 for solid waste disposal; and $2 for the park district. Assuming that the City would only be able to maintain 80 percent of this expenditure level, the per capita debt would be 80 percent of $121 or $97.

Under the all temporary housing-UCA assumption, the per capita cost does not include the cost of city-provided water and sewer services because these services would be provided by operators of mobile home parks. Assuming that the City would only be able to maintain 80 percent of the projected expenditure level, the per capita cost would be 80 percent of $54 or $43.

Under the all temporary housing-RCA assumption, the per capita cost is lower for the same reason as stated above. The per capita cost is 80 percent of $57 or $46.

APPENDIX J

County Equalization Fund

The total funds available from the County equalization fund under the 58 percent permanent/42 percent temporary housing assumption would be a 21 mill levy applied to a taxable value of $16.0 million (Table 7.10) or $337,000. The total funds available from the County equalization fund under the 100 percent temporary housing assumption would be a 21 mill levy applied to a taxable value of $4.4 million or $93,000.

The County equalization fund would be divided among the school districts according to their percentage of the total enrollment during the construction period. The number of students enrolled (determined by the number of households times 1.35 students) and the percentage of the total funds available under UCA and RCA are as follows:

Place	UCA	RCA
Rural	1,557 (14%)	4,052 (36%)
Beulah	4,949 (44%)	3,635 (33%)
Hazen	4,240 (38%)	3,162 (28%)
Stanton	409 (4%)	306 (3%)
	11,155 (100%)	11,155 (100%)

The amount of County equalization funds available to each school district is estimated to be as follows:

	Permanent/Temporary		All Temporary	
Place	UCA	RCA	UCA	RCA
Rural	$ 47,000	$121,000	$13,000	$33,000
Beulah	148,000	112,000	41,000	31,000
Hazen	128,000	94,000	35,000	26,000
Stanton	14,000	10,000	4,000	3,000
TOTAL	$337,000	$337,000	$93,000	$93,000